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# F/EF-111 BASING AT CANNON AIR FORCE BASE

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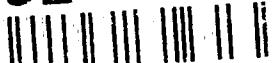
Curry County, New Mexico

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## Final Environmental Impact Statement

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## United States Air Force

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May, 1992

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# FINAL ENVIRONMENTAL IMPACT STATEMENT

## F/EF-111 BASING AT CANNON AIR FORCE BASE

APRIL 1992

United States Air Force

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Statement A per telecon Brenda Cook  
HQ TAC/CEVE  
Langley AFB, VA 23665  
NWW 6/25/92

**Final Environmental Impact Statement  
Realignment of Cannon Air Force Base**

**Responsible Agency:** United States Air Force

**Action:** In response to the recommendations of the Defense Secretary's Commission on Defense Base Closure and Realignment to legislative requirements in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510), Cannon Air Force Base is to undergo a realignment of aircraft and personnel. The Base F-111 aircraft count will be increased from the current level of 62 to 105. This will collocate all F/EF-111 aircraft based in the U.S. at this Base. It is expected that this realignment will increase manpower authorizations from 4,670 to 5,698. In order to maintain Fighter Wing efficiencies and combat readiness, increased use of Military Training Routes, Melrose Range, and construction on Base and at Melrose Range, Mount Dora Military Operations Area (MOA), and Pecos MOA are proposed actions associated with the realignment.

**Contact for Further Information:**

Brenda Cook  
HQ TAC/CEVE  
Langley AFB, Virginia 23665  
Phone: (804) 764-2909

**Designation:** Final Environmental Impact Statement (FEIS)

**Abstract:** This statement assesses the potential environmental impacts from the realignment of Cannon Air Force Base, located in Curry County, 7 miles west of the town of Clovis, New Mexico, and associated airspace activities in northeastern New Mexico. The realignment would significantly increase airspace activity at the Base and surrounding operational airspace regions. The impacts resulting from the realignment are due to population and noise increases.

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## ACRONYMS AND ABBREVIATIONS

ACC	Air Combat Command
AFB	Air Force Base
AFCESA	Air Force Civil Engineering Support Agency
ANG	Air National Guard
AGE	Aerospace Ground Equipment
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
CCES	Canyon Colorado Equid Sanctuary
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
CONUS	Continental United States
CP	Closed Pattern
CUD	Compatible Use District
CUZ	Compatible Use Zone
CZ	Clear Zone
dB	Decibels
EIS	Environmental Impact Statement
ENMU	Eastern New Mexico University
EPCOG	Eastern Plains Council of Governments
FAA	Federal Aviation Administration
FAAH	Federal Aviation Administration Handbook
FEIS	Final Environmental Impact Statement
FL	Flight Level
FTE	Full-Time Equivalent
FW	Fighter Wing
FY	Fiscal Year
gpm	Gallons per Minute
IFR	Instrument Flight Rules
IR	Instrument Route
MAILS	Multiple Aircraft Instantaneous Line Source
MFH	Military Family Housing
mgpd	Million Gallons per Day
MOA	Military Operations Area
MSL	Mean Sea Level
MTRs	Military Training Routes
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
nm	Nautical Miles
NMAAQS	New Mexico Ambient Air Quality Standards
NMSHPO	New Mexico State Historic Preservation Officer
NOI	Notice of Intent
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places

## ACRONYMS AND ABBREVIATIONS (Cont'd)

NWR	National Wildlife Refuge
NZ	Noise Zone
PAA	Primary Aircraft Authorizations
PACE	Planning Authority for Cannon Expansion
PSD	Prevention of Significant Deterioration
RAF	Royal Air Force
RCO	Range Control Office
ROD	Record of Decision
ROI	Region of Influence
SAC	Strategic Air Command
SEL	Sound Exposure Level
SUA	Special Use Airspace
TAC	Tactical Air Command
TSP	Total Suspended Particulates
TW	Training Wing
UK	United Kingdom
USAF	United States Air Force
VFR	Visual Flight Rules
VR	Visual Route
WSMR	White Sands Missile Range

## EXECUTIVE SUMMARY

The Defense Base Closure and Realignment Commission was established by the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510, November 5, 1990). The purpose of the commission was to recommend military installations for realignment and closure. Congress reserved the right to reject the commission's recommendations, but only by rejecting all of them within a waiting period of 45 legislative days. The commission submitted its recommendations to the President on July 1, 1991. The President adopted the recommendations, and Congress did not reject them. Accordingly, the Air Force is now required by law to implement the base closures and realignments recommended by the commission. These recommendations include relocating 25 EF-111A aircraft to Cannon AFB, NM.

In an action independent of the above relocations, the Air Force has proposed to relocate the following aircraft to a single base within the continental United States (CONUS):

- 18 F-111E aircraft from RAF Upper Heyford, UK
- 42 F-111F aircraft from RAF Lakenheath, UK
- 2 F-111F aircraft from McClellan AFB, CA.

Presently, the only bases within CONUS supporting F/EF-111 missions are Mountain Home AFB, ID, and Cannon AFB, NM. Since the Commission's recommendations included relocating the EF-111 aircraft to Cannon AFB, the Air Force has proposed to also locate the other affected F/EF-111 aircraft to this same location. Considered together, the Base Realignment and Closure Action and the independent Air Force proposal would involve the relocation of 87 aircraft to Cannon AFB. In addition, 18 F-111F aircraft are scheduled for relocation from RAF Lakenheath to Cannon AFB. This action has been separately evaluated as a categorical exclusion under the National Environmental Policy Act (NEPA). This EIS considers the effect of the 87 F/EF-111 aircraft to Cannon AFB and includes consideration of the cumulative effects of the 18 F-111F aircraft currently scheduled for relocation.

In addition to the proposed action, several alternatives have been considered:

1. No Action
2. Delayed Action
3. Alternative Locations

Since the President accepted the Commission's recommendations, and Congress did not reject these recommendations, the relocations are now mandated by law. As a result, the no action alternative would require retiring the affected aircraft in place. The delayed action alternative is considered feasible as long as the delay would not cause retirement of aircraft at a base as a result of other scheduled actions. Mountain Home AFB and Cannon AFB are the only CONUS F/EF-111 bases. Relocation of the EF-111 aircraft at Mountain

Home AFB was included in the Commission's recommendations. Cannon AFB is the only other existing F/EF-111 base that could support the affected aircraft. As a result there are no existing locations that could be assessed under this alternative.

The present analysis provides a discussion of the background for this action (Chapter 1); a detailed discussion of the action itself and its alternatives (Chapter 2); a description of the affected environment (Chapter 3), and an examination of the environmental impacts of the proposed action and its alternatives (Chapter 4). A brief summary is provided below of the environmental impacts associated with the proposed action, ordered by affected resource (land use, air quality, noise, airspace management, socioeconomic, biology, water, and archaeological, cultural, and historical resources).

**Land Use.** Under the proposed action land within the Ldn 65 dB contour at Cannon AFB would increase by 18%. The affected area is primarily agricultural land and no adverse impact on land use would be expected. Projected Ldn noise levels on MTRs, MOAs, and Ranges are less than 65 dB, and no adverse impact on land use is projected.

**Air Quality.** Emissions in the vicinity of Cannon AFB and affected MTRs, Ranges, and MOAs would increase. No significant impact on air quality in these areas is projected. No significant impact on Prevention of Significant Deterioration (PSD) Class I areas is projected. The action would not result in a non-conformance with the Clean Air Act of 1990.

**Noise.** The area encompassed within the Ldn 65 dB noise contour near Cannon AFB would increase by 18%. Because the affected area is primarily agricultural land, few additional people would be exposed to noise levels above Ldn 65 dB. Noise levels would increase on land under the affected MTRs and MOAs. In no case would the Ldn noise levels on the affected MOAs or MTRs exceed 65 dB. Noise levels on the affected Ranges would increase by 2 dB on Red Rio Range and negligibly on Oscura Range. Land underlying the Ldn 65 dB contour at Melrose Range would increase by 25 square miles (36%). The affected area is primarily agricultural land outside of the restricted easement; the area is sparsely populated and few additional people would be affected.

**Airspace Management.** No adverse impact on airspace utilized by other aviation concerns is projected. Civil VFR and military aircraft would need to exercise increased vigilance in those unrestricted areas where military activity is projected to increase.

**Socioeconomics.** Population in Clovis and Portales would increase. Employment would increase by more than 1600 positions. Earnings would increase by 6%. Community services would be strained in the short term by increased demand. Increased utility demands are within area capacity. Increased school enrollment would require additional staff and might require additional facilities. Low income housing is in short supply in the area affected by the action. The Realignment will exacerbate this condition. Electronic warfare

countermeasures training is not expected to adversely affect radio-communication in the area.

**Biological Resources.** Construction at Cannon AFB and Melrose Range is of small scale and in previously disturbed areas. No significant biological impact would be expected in these areas from construction. Increased noise levels, use of chaff and flare, and electromagnetic emissions from electronic warfare training would not be expected to result in significant adverse impact to biota or to human health. Increased sortie rates may increase startle effect. The affected MTRs, however, are broad, and any potential impacts would be widely dispersed. Changes in sortie rates over the ranges would have negligible effect given their current high rate of utilization. Given the high floor of Mount Dora and Pecos MOAs, no adverse impact from startle effect would be expected. Bird-aircraft strike is of potential concern for high flying species (Canada and snow geese, bald and golden eagles, and peregrine falcons), particularly in the area underlying Mount Dora MOA and along the Pecos River drainage basin. The Air Force recognizes the potential adverse effects of bird aircraft strikes on birdlife as well as on aircraft and crew, and goes to considerable length to avoid such effects. Cannon AFB has established bird-aircraft strike hazard procedures (27th TFW, 1991) governing aircraft operations in the areas of concern. Locally, about 70 airstrikes are recorded annually in the affected MTRs. This low frequency of bird-aircraft collisions is in part due to existing flight rules designed to prevent such events.

**Water Resources.** No adverse impact to surface or ground water resources would be expected.

**Archaeological, Cultural, and Historical Resources.** Archaeological, cultural, or historical resources would not be adversely affected by construction since the affected areas on Cannon AFB and Melrose Range have been previously disturbed or have low potential for such resources. Vibration related impacts associated with overflight of aircraft at low altitude would not be expected since known above ground resources would continue to be avoided under existing flight rules.

## CHAPTER 1.0 - INTRODUCTION

### 1.1 BACKGROUND AND NEED

The Defense Base Closure and Realignment Commission was established by the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510, November 5, 1990). The purpose of the commission was to recommend military installations for realignment and closure. Congress reserved the right to reject the commission's recommendations, but only by rejecting all of them within a waiting period of 45 legislative days. The commission submitted its recommendations to the President on July 1, 1991. The President adopted the recommendations, and Congress did not reject them. Accordingly, the Air Force is now required by law to implement the base closures and realignments recommended by the commission. These recommendations include relocating 25 EF-111A aircraft to Cannon Air Force Base (AFB), NM.

In an action independent of the above relocations, the Air Force has proposed to relocate the following aircraft to a single base within the continental United States (CONUS):

- 18 F-111E aircraft from RAF Upper Heyford, UK
- 42 F-111F aircraft from RAF Lakenheath, UK
- 2 F-111F aircraft from McClellan AFB, CA.

Presently, the only bases within CONUS supporting F/EF-111 missions are Mountain Home AFB, ID, and Cannon AFB, NM. Since the Commission's recommendations included relocating the EF-111 aircraft to Cannon AFB, the Air Force has proposed to also locate the other affected F/EF-111 aircraft to the same location. Considered together, the Base Realignment and Closure Action and the independent Air Force proposal would involve the relocation of 87 aircraft to Cannon AFB. In addition, 18 F-111F aircraft are scheduled for relocation from RAF Lakenheath to Cannon AFB. This action has been separately evaluated as a categorical exclusion under the National Environmental Policy Act (NEPA). This EIS considers the effect of the 87 F/EF-111 aircraft to Cannon AFB and includes consideration of the cumulative effects of the 18 F-111F aircraft currently scheduled for relocation.

To accommodate these relocations (including the scheduled relocation of 18 F-111F aircraft from RAF Lakenheath) Air Combat Command (ACC)\* would retire the 59 F-111D aircraft and 18 F-111G aircraft presently based at Cannon AFB. Following all of the above relocations and retirements a total of 105 Primary Aircraft Authorizations (PAA) would be assigned to Cannon AFB.

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\*These actions were originally proposed by Tactical Air Command (TAC). On June 1, 1992, TAC will become Air Combat Command (ACC). The proponent of this action will be referred to as ACC throughout this document.

These actions should be considered in light of a previous action at Cannon AFB mandated under the Base Realignment and Closure Act (Public Law 100-526; October 24, 1988). That action was required as a matter of law and involved the co-location of all similar mission, U.S. based F-111 aircraft at Cannon AFB. Under the action PAAs at Cannon AFB would have increased from 62 to 108. That action was evaluated under NEPA; a Final Environmental Impact Statement (FEIS) on the action was released to the public in May 1990 (TAC, 1990). A Record of Decision (ROD) authorizing the action was issued June 18, 1990. In the fourth quarter of fiscal year 1990 (FY 90/4), as a result of the implementation of the decision contained within the ROD, the number of F-111 aircraft at Cannon AFB increased from 62 to 77 PAA. An additional 30 F-111G aircraft were scheduled to be realigned to Cannon AFB in FY 92/1. This latter component of the action, however, has not taken place. Instead, the aircraft in question have been retired.

## 1.2 SCOPING AND PREPLANNING ANALYSIS

While the total number of aircraft being realigned to Cannon AFB is close to the number evaluated in the 1990 proposed action, the mix of aircraft is sufficiently different to warrant analysis of the environmental impacts of the new proposed action. As a result of this decision, a Notice of Intent (NOI) was filed August 5, 1991, and Public Scoping Meetings required under NEPA were held August 27 and 28, 1991, in Clovis and Portales, NM. The public comment period extended to September 6, 1991. Draft Environmental Impact Statement for this action was released to the public December 27, 1991. A public hearing was held January 21, and January 22, 1992 in Clovis and Portales, New Mexico. Transcripts for these hearings are provided in Appendix C. Public comment period for reviewing the DEIS ended February 16, 1992. Written comments received during the public comment period are provided in Appendix D. Appendix E provides brief precis of the comments and a written response indicating how the comment was handled with respect to preparing the Final Environmental Impact Statement.

The proposed action is presented in Chapter 2 in sufficient detail to allow an evaluation of its potential environmental impacts. Review of the proposed action, including input received from the Public Scoping Meetings and from other information received during the Public Comment Period, indicated several environmental areas warranting analysis. Basing additional aircraft over and above those currently authorized would result in changes in base personnel, on-base construction, and changes in flight operations out of Cannon AFB and within various affected special use airspace (SUA) areas. This preliminary review indicates that the action has the potential to affect land and airspace use, air quality, noise levels, socioeconomic conditions, biological and water resources, and archaeological, cultural, and historical resources. Chapter 3 provides sufficient information on baseline conditions to provide a basis for assessing potential impacts to these resources. Impact analysis of these resources is presented in Chapter 4.

In addition to the proposed action, several alternatives have been considered:

1. Alternative Locations
2. Delayed Action
3. No Action

These alternatives are also detailed in Chapter 2. Potential impacts from these alternatives are presented in Chapter 4.

This action would not result in the creation of new waste or effluent streams at Cannon AFB. The increased maintenance requirements at the base due to the presence of additional aircraft would result in an increase in the amount of solid and hazardous wastes processed as well as the volume of industrial/domestic wastewater generated at the base. These issues were addressed in the evaluation of the 1990 realignment (TAC, 1990). At that time it was concluded that the additional volume of waste and effluent generated under that action would be within existing handling and treatment capacity of the base. As a result, no adverse environmental impacts were projected due to these sources for that proposed action. The manpower authorizations and the total number of aircraft at Cannon AFB under the proposed action are virtually identical to those assessed in detail in TAC, 1990. The change in the mix of aircraft under the two actions would not qualitatively or quantitatively affect waste or effluent generation. As a result, waste and effluent generation under the proposed action is considered to differ in no substantive manner from that assessed in TAC, 1990. Therefore, the conclusions concerning solid and hazardous wastes and effluent related impacts presented in TAC, 1990 are incorporated by reference. No further analysis is warranted. The proposed action will not require land acquisition; therefore, impacts to mineral resources due to displacement or removal of potential resources for development would not occur. Overflight by aircraft would not preclude use of land for mineral extraction and recovery. No further analysis to mineral resources is warranted. Finally, at this time the proposed action is not expected to require modification of any existing environmental permit, license, or other entitlement which would be obtained in implementing 40 CFR 1502 (b). As a result, a detailed analysis of permits, licenses, or entitlement is not required. At this time, the proposed action is not expected to require modification of any existing permit governing base operations.

## CHAPTER 2.0 - DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

### 2.1 THE PROPOSED ACTION

#### 2.1.1 Equippage

Table 2-1 summarizes the changes in equippage entailed in this proposed action (Proposed 1991). Also shown in Table 2-1 are the changes associated with the 1990 realignment of Cannon AFB as proposed (Proposed 1990) and as executed (Incurred 1991). Under the 1990 realignment, the number of F-111 PAA at Cannon AFB would have increased from 62 to 108. Owing to other force structure changes, the F-111s actually increased to only 77 PAA. Under the proposed action, the resulting number of F-111s at Cannon would stand at 105 PAA, 3 fewer than proposed in the 1990 Realignment.

#### 2.1.2 Manpower

Table 2-2 summarizes the manpower changes under the 1990 Realignment and under the proposed action. As a result of the decision not to add 48 PAA F-111G aircraft as planned under the 1990 Realignment, personnel at Cannon AFB increased by somewhat fewer than 700 manpower authorizations, compared to the nearly 1,800 projected. Under this proposed action, personnel at Cannon AFB would increase to 5,698, roughly 25 manpower authorizations fewer than projected in the 1990 realignment proposal. This still represents an increase of about 1,000 staff positions over the current manpower authorizations.

#### 2.1.3 Flight Operations

Under the proposed action, base sortie levels would increase from about 11,200 to about 15,100 annually; airspace use requirements would increase similarly. Airspace areas that would be affected by this action include, in addition to the Base airdrome, Melrose, Red Rio, and Oscura Ranges; Mount Dora\* and Pecos Military Operations Areas (MOAs); and all Cannon Military Training Routes (MTRs) that provide access to and egress from these airspace areas. Figure 2-1 shows the location of these airspace areas relative to Cannon AFB. Table 2-3 summarizes the annual sortie numbers by airspace unit and provides a comparison of past proposed and incurred conditions under the 1990 Realignment, and projected conditions under the current 1991 Realignment proposal. Also shown are projected changes in use associated with the recently approved realignment of the 37th Fighter Wing (FW) from Tonopah Test Range, NV, to Holloman AFB, NM. While this realignment has been authorized, it has not yet occurred and its effects are not yet reflected in current baseline

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\* Mount Dora is a proposed MOA in northeastern New Mexico. The environmental impacts of the creation of this MOA were evaluated in TAC, 1990.

**Table 2-1. Changes In Primary Aircraft Authorizations  
at Cannon AFB**

**As Proposed 1990**

Aircraft Type	90/3	90/4	91/1	91/2	91/3	91/4	92/1	92/2	92/3	92/4
F-111D	62	62	62	62	62	62	60	60	60	60
F-111G	0	18	18	18	18	18	48	48	48	48
<b>Total</b>	<b>62</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>108</b>	<b>108</b>	<b>108</b>	<b>108</b>

**As Incurred 1990-1991**

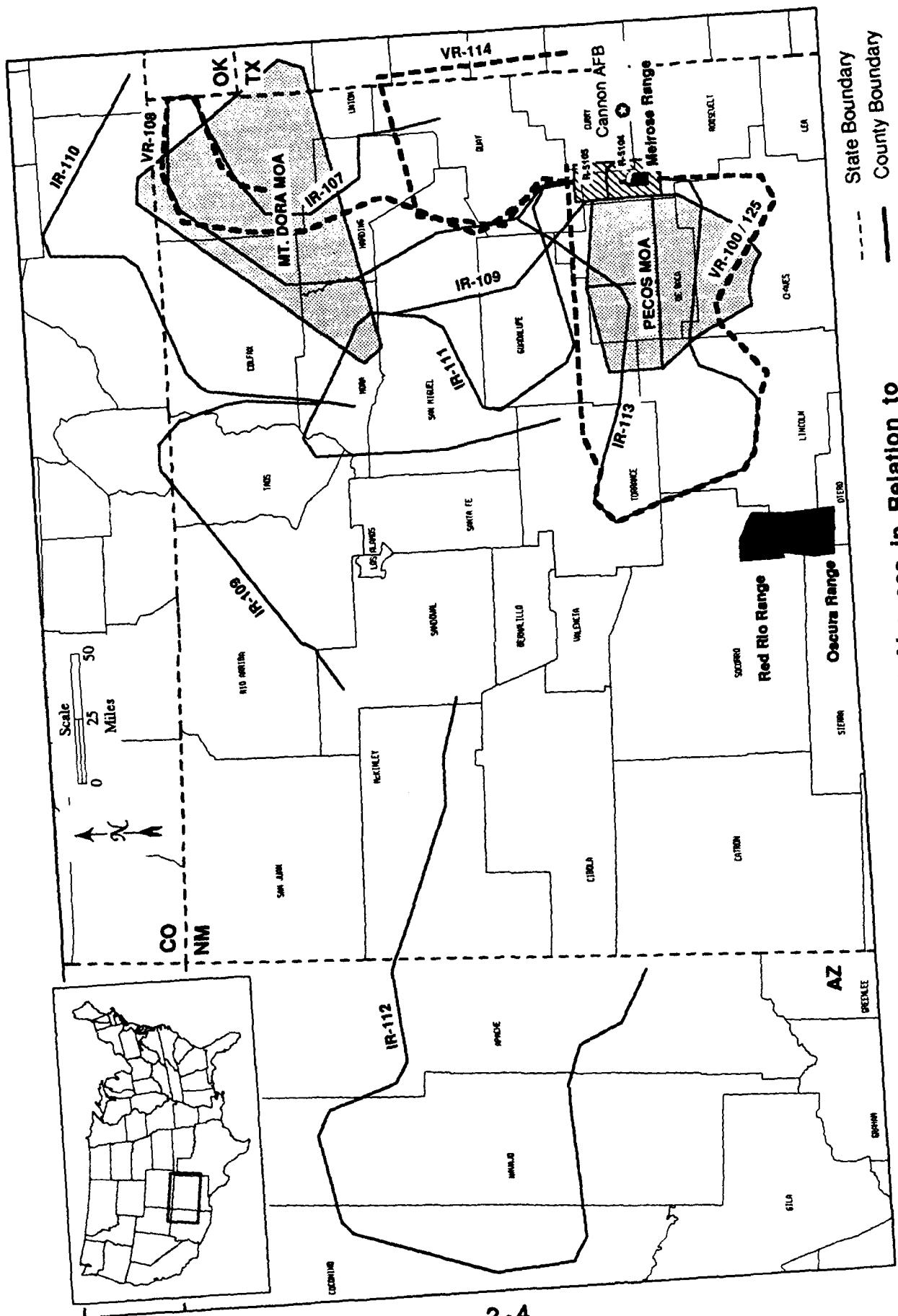
Aircraft Type	90/3	90/4	91/1	91/2	91/3	91/4	92/1	92/2	92/3	92/4
F-111D	62	59	59	59	59	59	59	59	59	59
F-111G	0	18	18	18	18	18	18	18	18	18
<b>Total</b>	<b>62</b>	<b>77</b>								

**As Proposed 1991**

Aircraft Type	90/3	90/4	91/1	91/2	91/3	91/4	92/1	92/2	92/3	92/4	Fiscal Year/Quarter
F-111D	62	59	59	59	59	59	42	18	0	0	0
F-111E	0	0	0	0	0	0	0	0	0	0	18
F-111F	0	0	0	0	0	0	18	44	62	62	62
F-111G	0	18	18	18	18	18	18	18	18	0	0
EF-111	0	0	0	0	0	0	0	25	25	25	25
<b>Total</b>	<b>62</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>105</b>	<b>105</b>	<b>105</b>	<b>105</b>

**Table 2-2 Changes In Manpower Authorizations  
at Cannon AFB**

Scenario	Manpower Authorizations By Fiscal Year/Quarter								
	90/3	90/4	91/1	91/2	91/3	91/4	92/1	92/2	92/3
<b>1990 Proposed</b>	3984	4663	4663	4663	4663	4663	5723	5723	5723
<b>1991 Incurred</b>	3984	4663	4663	4663	4663	4670	4670	4670	4670
<b>1992 Proposed</b>	3984	4663	4663	4663	4663	4670	4670	4670	4670
<b>Increase Due to Proposed Action</b>	0	0	0	0	0	0	0	1028	1028



**Figure 2-1. Affected Airspace in Relation to Cannon AFB**

**Table 2-3. Summary of Recent Actions and the Proposed Action  
At Cannon AFB**

Category	Aircraft	PRE 1990	Projected 1991	Incurred 1991	Other Actions	Proposed Action	Post 1991
PAA Aircraft at Base	F-111	62	108	78		2	80
	EF-111					25	25
	<b>Total</b>	<b>62</b>	<b>108</b>	<b>78</b>	<b>0</b>	<b>27</b>	<b>105</b>
Annual Sorties From Base	F-111	8190	16190	11186		334	11520
	EF-111					3600	3600
	<b>Total</b>	<b>8190</b>	<b>16190</b>	<b>11186</b>	<b>0</b>	<b>3934</b>	<b>15120</b>
Annual Sorties to Melrose Range	F-111	3646	6396	5230		3410	8640
	EF-111	0	0	0		900	900
	F-117	0	0	0	1440		1440
	A-7	1477	1477	1477			1477
	A-6	47	47	47			47
	F-18	74	74	74			74
	B1-B	48	48	48			48
	B-52G	91	91	91			91
	Other	171	171	171			171
	<b>Total</b>	<b>5554</b>	<b>8304</b>	<b>7138</b>	<b>1440</b>	<b>4310</b>	<b>12888</b>
Annual Sorties to Red Rio Range	F-111	10	10	10		2294	2304
	EF-111	0	0	0		240	240
	F-117	0	0	0	4782		4782
	AT-38	1480	1480	1480	1230		2710
	A-7	178	178	178			178
	HH-53	202	202	202			202
	F-16	53	53	53			53
	A-10	14	14	14			14
	F-18	2	2	2			2
	RF-4	1	1	1			1
Annual Sorties to Oscura Range	<b>Total</b>	<b>1940</b>	<b>1940</b>	<b>1940</b>	<b>6012</b>	<b>2534</b>	<b>10486</b>
	F-111	4	4	4		572	576
	EF-111	0	0	0		60	60
	F-117	0	0	0	3712		3712
	AT-38	3989	3989	3989	896		4885
	A-7	181	181	181			181
	A-10	6	6	6			6
	HH-53	24	24	24			24
	RF-4	1	1	1			1
	F-4	14	14	14			14
	F-16	13	13	13			13
<b>Total</b>		<b>4232</b>	<b>4232</b>	<b>4232</b>	<b>4608</b>	<b>632</b>	<b>9472</b>

**Table 2-3 (Continued). Summary of Recent Actions and the Proposed Action at Cannon Air Force Base**

Category	Aircraft	PRE 1990	Projected 1991	Incurred 1991	Other Actions	Proposed Action	Post 1991
Annual Sorties to Mt. Dora	F-111	0	792	0		5760	5760
	EF-111			0		1800	1800
	Other*	0	1036	0		1036	1036
	<b>Total</b>	<b>0</b>	<b>1828</b>	<b>0</b>	<b>0</b>	<b>8596</b>	<b>8596</b>
Annual Sorties to Pecos MOA	F-111		670	1326		4434	5760
	EF-111					1800	1800
	F-15		1150	7274			7274
	F-16			4			4
	<b>Total</b>	<b>0</b>	<b>1820</b>	<b>8604</b>	<b>0</b>	<b>6234</b>	<b>14838</b>
Annual Sorties to IR-107	F-111	1504	3126	2124		-166	1958
	EF-111					612	612
	<b>Total</b>	<b>1504</b>	<b>3126</b>	<b>2124</b>	<b>0</b>	<b>446</b>	<b>2570</b>
Annual Sorties to IR-109	F-111	948	1937	1324		-172	1152
	EF-111					360	360
	<b>Total</b>	<b>948</b>	<b>1937</b>	<b>1324</b>	<b>0</b>	<b>188</b>	<b>1512</b>
Annual Sorties to IR-110	F-111			172		404	576
	EF-111					180	180
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>172</b>	<b>0</b>	<b>584</b>	<b>756</b>
Annual Sorties to IR-111	F-111	949	1938	1325		-58	1267
	EF-111					396	396
	<b>Total</b>	<b>949</b>	<b>1938</b>	<b>1325</b>	<b>0</b>	<b>338</b>	<b>1663</b>
Annual Sorties to IR-112	F-111			161		150	311
	EF-111					100	100
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>161</b>	<b>0</b>	<b>250</b>	<b>411</b>
Annual Sorties to IR-113	F-111	1200	2400	1652		-385	1267
	EF-111					396	396
	<b>Total</b>	<b>1200</b>	<b>2400</b>	<b>1652</b>	<b>0</b>	<b>11</b>	<b>1663</b>
Annual Sorties to VR-100	F-111	252	504	347		575	922
	EF-111					288	288
	<b>Total</b>	<b>252</b>	<b>504</b>	<b>347</b>	<b>0</b>	<b>863</b>	<b>1210</b>
Annual Sorties to VR-108	F-111	322	656	449		127	576
	EF-111					180	180
	<b>Total</b>	<b>322</b>	<b>656</b>	<b>449</b>	<b>0</b>	<b>307</b>	<b>756</b>
Annual Sorties to VR-114	F-111	1200	2400	1652		537	2189
	EF-111					684	684
	<b>Total</b>	<b>1200</b>	<b>2400</b>	<b>1652</b>	<b>0</b>	<b>1221</b>	<b>2873</b>
Annual Sorties to VR-125	F-111	252	504	347		114	461
	EF-111					144	144
	<b>Total</b>	<b>252</b>	<b>504</b>	<b>347</b>	<b>0</b>	<b>258</b>	<b>605</b>

conditions. To provide an analysis of the effects of the 1991 Cannon Realignment proposal, it is necessary to consider the projected effects of the 37th FW Realignment. In Table 2-3, the "Incurred 1991" column indicates current annual sortie rates for the affected airspace units. This column represents existing baseline conditions. The "Post 1991" column indicates the projected combined effects of the 1991 Cannon Realignment and the realignment of the 37th FW to Holloman. Table 2-4 provides data on the annual day-night sorties for the various affected airspace areas. The column marked "1991 Baseline" reflects current (1991) conditions within the airspace. The column marked "1992 Projected Baseline" indicates conditions assuming that the 37th FW realignment has been carried forward. The final column, marked "Proposed Action," superimposes the proposed action on the projected 1992 baseline.

Table 2-5 summarizes operating conditions for F-111 and EF-111 aircraft. For analysis, these conditions are assumed to apply to both past and future flight operations. Under this action, approximately 50 sorties per month would release chaff on one of the affected ranges. An additional 50 sorties would release flares at altitudes in excess of 700 feet above ground level (AGL). In addition to its role as a provider of electronic countermeasures in support of tactical air forces, the EF-111 would make use of electromagnetic emissions to detect and render ineffective battlefield acquisition radar units.

#### **2.1.4 Construction**

The proposed action would represent approximately \$58 million in construction costs (Table 2-6.). This construction would involve site improvements, housing, utility support work, and preparation of parking areas. Approximately 230 acres, would be affected on the base. Table 2-6 itemizes proposed construction actions. Figure 2-2 shows the location of the proposed construction. An additional 2,000 square feet (less than 0.05 acres) of land on Melrose Range would also be disturbed during the construction of range training facilities and support utilities. No other construction on the affected ranges would be required to support the proposed action.

### **2.2 ALTERNATIVES TO THE PROPOSED ACTION**

#### **2.2.1 No Action**

The relocations from their current base of the F-111 and EF-111 aircraft considered under the proposed action are mandated under law or directed by the Air Force. Under the no action alternative, these aircraft would have to be retired. This would leave a critical shortfall in the F-111 force structure. As a result, this alternative is not considered desirable.

**Table 2-4. Annual Sorties Under the 1991 Baseline, 1992 Baseline, and the Proposed Action**

	Aircraft	1991 Baseline			1992 Projected Baseline			Proposed Action		
		0700- -2200	2200- 0700	Total	0700- -2200	2200- 0700	Total	0700- -2200	2200- 0700	Total
Base	F-111	10627	559	11186	10627	559	11186	10596	924	11520
	EF-111	0	0	0	0	0	0	3312	288	3600
	Total	10627	559	11186	10627	559	11186	13908	1212	15120
Melrose Range	F-111	5230	0	5230	5230	0	5230	7949	691	8640
	EF-111	0	0	0	0	0	0	720	180	900
	F-117	0	0	0	864	576	1440	864	576	1440
	A-7	1342	0	1342	1342	0	1342	1342	0	1342
	A-6	0	0	0	0	0	0	0	0	0
	F-18	33	0	33	33	0	33	33	0	33
	B1-B	18	0	18	18	0	18	18	0	18
	B-52G	67	0	67	67	0	67	67	0	67
	Other	27	0	27	27	0	27	27	0	27
	Total	6717	0	6717	7581	576	8157	11020	1447	12467
Red Rio Range	F-111	10	0	10	10	0	10	2120	184	2304
	EF-111	0	0	0	0	0	0	192	48	240
	F-117	0	0	0	3942	840	4782	3942	840	4782
	AT-38	1480	0	1480	2710	0	2710	2710	0	2710
	A-7	178	0	178	178	0	178	178	0	178
	HH-53	202	0	202	202	0	202	202	0	202
	F-16	53	0	53	53	0	53	53	0	53
	A-10	14	0	14	14	0	14	14	0	14
	F-18	2	0	2	2	0	2	2	0	2
	RF-4	1	0	1	1	0	1	1	0	1
	Total	1940	0	1940	7112	840	7952	9414	1072	10486
Oscura Range	F-111	4	0	4	4	0	4	530	46	576
	EF-111	0	0	0	0	0	0	48	12	60
	F-117	0	0	0	2872	840	3712	2872	840	3712
	AT-38	3989	0	3989	4885	0	4885	4885	0	4885
	A-7	181	0	181	181	0	181	181	0	181
	A-10	6	0	6	6	0	6	6	0	6
	HH-53	24	0	24	24	0	24	24	0	24
	RF-4	1	0	1	1	0	1	1	0	1
	F-4	14	0	14	14	0	14	14	0	14
	F-16	13	0	13	13	0	13	13	0	13
	Total	4232	0	4232	8000	840	8840	8574	898	9472

**Table 2-4 (Continued) Sorties for 1991 Baseline,  
1992 Baseline, and the Proposed Action**

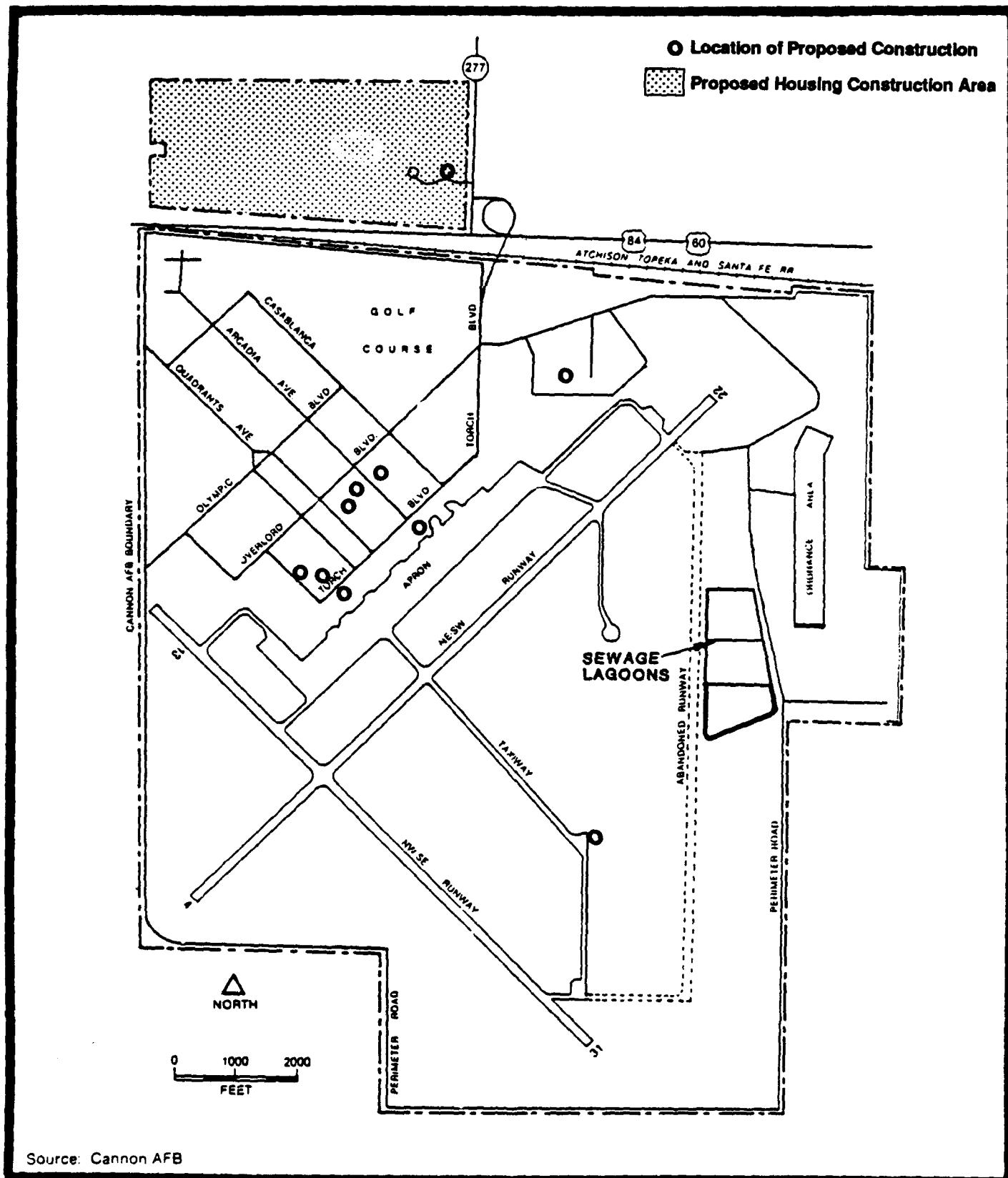
	Aircraft	1991 Baseline			1992 Projected Baseline			Proposed Action		
		0700- -2200	2200- 0700-	Total	0700- -2200	2200- 0700-	Total	0700- -2200	2200- 0700-	Total
Mount Dora MOA	F-111	0	0	0	792	0	792	4620	1140	5760
	EF-111	0	0	0	0	0	0	1656	144	1800
	Other*	0	0	0	1036	0	1036	1036	0	1036
	Total	0	0	0	1828	0	1828	7312	1284	8596
Pecos MOA	F-111	1219	107	1326	1219	107	1326	4620	1140	5760
	EF-111	0	0	0	0	0	0	1656	144	1800
	F-15	7200	74	7274	7200	74	7274	7200	74	7274
	F-16	4	0	4	4	0	4	4	0	4
Total		8423	181	8604	8423	181	8604	13480	1358	14838
IR-107	F-111	2124	0	2124	2124	0	2124	1801	157	1958
	EF-111							563	49	612
	Total	2124	0	2124	2124	0	2124	2364	206	2570
IR-109	F-111	1324	0	1324	1324	0	1324	1060	92	1152
	EF-111							331	29	360
	Total	1324	0	1324	1324	0	1324	1391	121	1512
IR-110	F-111	172	0	172	172	0	172	530	46	576
	EF-111							166	14	180
	Total	172	0	172	172	0	172	696	60	756
IR-111	F-111	1325	0	1325	1325	0	1325	1166	101	1267
	EF-111							364	32	396
	Total	1325	0	1325	1325	0	1325	1530	133	1663
IR-112	F-111	161	0	161	161	0	161	125	25	150
	EF-111							75	25	100
	Total	161	0	161	161	0	161	200	50	250
IR-113	F-111	1652	0	1652	1652	0	1652	1166	102	1267
	EF-111							364	32	396
	Total	1652	0	1652	1652	0	1652	1530	134	1663
VR-100	F-111	347	0	347	347	0	347	848	74	922
	EF-111							265	23	288
	Total	347	0	347	347	0	347	1113	97	1210
VR-108	F-111	449	0	449	449	0	449	530	46	576
	EF-111							166	14	180
	Total	449	0	449	449	0	449	696	60	756
VR-114	F-111	1652	0	1652	1652	0	1652	2014	175	2189
	EF-111							629	55	684
	Total	1652	0	1652	1652	0	1652	2643	230	2873
VR-125	F-111	347	0	347	347	0	347	424	37	461
	EF-111							132	12	144
	Total	347	0	347	347	0	347	557	48	605

**Table 2-5. Flight Operation Profiles  
for F-111 and EF-111 Aircraft**

	Aircraft					
	F-111			EF-111		
Sorties/Month	Range	MTR	MOA	Range	MTR	MOA
7:00 a.m. to 10:00 p.m.	883	883	883	80	276	276
10:00 p.m. to 7:00 a.m.	77	77	77	20	24	24
Total	960	960	960	100	300	300
<b>Average KIAS</b>	475	475	475	475	475	475
<b>Average % Power</b>	92	92	92	95	95	95
<b>AGL Profile in %</b>						
100-300	20	6		2	6	
300-500	35	35		15	35	
500-1000	20	45		30	45	
1000-10000	20	14		50	14	
10000+	5	0		3		
Total	100	100		100	100	

**Table 2-6. Construction for the F/EF-111  
Basing Action**

<b><u>PROJECT</u></b>	<b><u>SCOPE</u></b>
Operations/Training	
ADAL Squadron Operations	5,000 SF
Software Support	6,700 SF
EW Range Support	LS
Maintenance Complex	
Sm Aircraft Mx Dock	57,000 SF
ADAL FTD Facility	3,000 SF
NAVAIR Shelter Support	LS
Quick Check Pads	3,400 SF
ADAL Misc. Facility	LS
Base Support/Infrastructure	
Military Housing	229 acres
Dorm (200 PN)	41,000 SF
Child Development Center	7,500 SF
ADAL Roads and Parking	LS
ADAL Utilities	LS
ADAL Base Supply	21,000 SF



**Figure 2-2 Location of Proposed Construction at Cannon AFB**

### **2.2.2 Delayed Action**

ACC has recommended that the EF-111 aircraft currently based at Mountain Home AFB, ID, be redeployed by FY 92/3 to prepare for the formation of a composite wing at that location. In addition, the decision to place RAF Upper Heyford UK in caretaker status by FY 95/1 requires that the F-111 and EF-111 aircraft currently based there be redeployed to another location by that date. The relocation of the F-111F aircraft at RAF Lakenheath UK can be delayed until FY 93/3. The first component of the proposed action to be initiated would be the relocation of the EF-111 aircraft from Mountain Home AFB. This component of the action cannot reasonably be delayed without either delaying the formation of the composite wing at Mountain Home or resulting in retirement of the EF-111 aircraft. Neither of these results is considered acceptable from the perspective of maintaining a strong national defense.

### **2.2.3 Alternative Locations**

Recent force structure decisions mandate the redeployment of the EF-111s from Mountain Home AFB, ID, and of the F-111s from the UK to a U.S. base within CONUS. The current U.S. basing structure is a product of carefully matched operational requirements and available facility/training space resources. As a result, new beddowns are often constrained to bases with similar equipment or missions. In addition, most bases have ongoing missions that could be prohibitively expensive and programmatically disruptive to relocate. The only CONUS bases that currently support F-111 or EF-111 missions are Cannon AFB and Mountain Home AFB. The decision to convert Mountain Home AFB to support a composite wing means that the only remaining base that could receive the affected F-111's and EF-111's is Cannon AFB. As a result, selecting an alternate site for beddown of the affected aircraft is not considered feasible.

## **2.3 Comparison of Impacts**

The environmental impacts of the Realignment action and alternatives are presented in Chapter 4. Table 2-7 presents a summary of those impacts. Since there are no feasible alternative locations, no impact analysis is presented for this alternative.

**Table 2-7. Comparison of Impacts Between Proposed action and the Alternative Actions.**

Discipline	Realignment Action	No Action	Delayed Action
<b>Land Use</b>	Land within the 65 dB Ldn contour at Cannon AFB will increase by 20%. The affected area is primarily agricultural land and no adverse impact on land use would be expected. Projected Ldn noise levels on MTRs, MOAs and Ranges are less than 65 dB, and no adverse impact on land use is projected	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to that under the Realignment Action.
<b>Air Quality</b>	Emissions in the vicinity of Cannon AFB, and affected MTRs, Ranges, and MOAs would increase. No significant impact on impact on air quality in these areas is projected. No significant impact on PSD Class I areas is projected. The action would not result in a non-conformance with the Clean Air Act of 1990.	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to that under the Realignment Action.
<b>Noise</b>	The area encompassed within the 65 dB Ldn noise contour near Cannon AFB would increase by 20%. Because the affected area is primarily agricultural land, few additional people would be exposed to noise levels above Ldn 65 dB. Noise levels would increase on land under the affected MTRs, and MOAs. In no case would the Ldn noise levels on the affected MOAs or MTRs exceed 65 dB. Noise levels on the affected Ranges would increase by 2 Ldn dB on Red Rio Range, and negligibly on Oscura Range. Land underlying the Ldn 65 dB contour at Melrose Range would increase by 25 square miles (36%). The affected area is primarily agricultural land outside of the restricted easement. The affected area is sparsely populated and few additional people would be affected.	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to that under the Realignment Action.

**Table 2-7. Comparison of Impacts Between Proposed Action and the Alternative Actions.**

Discipline	Realignment Action	No Action	Delayed Action
<b>Air Space Management</b>	No adverse impact on airspace utilized by other aviation concerns is projected. Civil VFR and military aircraft would need to exercise increased vigilance in those unrestricted areas where military activity is projected to increase	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to those under the Realignment Action.
<b>Socio-economics</b>	Population in Clovis and Portales would increase. Employment would increase by more than 1600 positions. Earnings would increase by 6%. Community services would be strained in the short term by increased demand. Increased utility demands are within area capacity, though additional industrial demand would exceed capacity. Increased school enrollment would require additional staff and might require additional facilities. Low income housing is in short supply in the area affected by the action. The Realignment will exacerbate this condition. Electronic warfare countermeasures training is not expected to adversely affect radiocommunication in the area.	No change from existing conditions	Projected effects would be spread out over a longer period of time. This could reduce severity of adverse impacts associated with increased service demands. Otherwise, impacts would be identical to those projected for the Realignment Action.

**Table 2-7. Comparison of Impacts Between Proposed Action and the Alternative Actions.**

Discipline	Realignment Action	No Action	Delayed Action
<b>Biology</b>	<p>Construction at Cannon AFB and Melrose Range would be of small scale and in previously disturbed areas. No significant biological impact would be expected in these areas from construction.</p> <p>Increased noise levels, use of chaff and flares, and electromagnetic emissions from electronic warfare training would not be expected to result in significant adverse impact to biota or to human health.</p> <p>Increased sortie rates may increase startle effect. The affected MTRs, however, are broad, and any potential impacts would be widely dispersed. Changes in sortie rate over the ranges would have negligible effect given their current high rate of utilization.</p> <p>Given the high floor of Mount Dora and Pecos MOAs, no adverse impact from startle effect would be expected. Bird-aircraft strike is of potential concern for high flying species (Canada and snow geese, bald and golden eagles, and peregrine falcons), particularly in the area underlying Mount Dora and along the Pecos River drainage basin.</p> <p>Existing bird hazard avoidance procedures employed by the Air Force have proven to be sufficient to reduce such effects. No adverse impact from this source is therefore, expected.</p>	<p>No Change from existing conditions.</p>	<p>Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to those under the Realignment Action.</p>

**Table 2-7. Comparison of Impacts Between Proposed action and the Alternative Actions.**

Discipline	Realignment Action	No Action	Delayed Action
<b>Water</b>	No adverse impact to surface or groundwater resources would be expected.	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to that under the Realignment Action.
<b>Archaeology</b>	Archaeological, cultural or historical resources would not be adversely affected by construction since the affected areas on Cannon AFB and Melrose range have been previously disturbed or have low potential for such resources. Vibration related impacts associated with overflight of aircraft at low altitude would not be expected since known above ground resources would continue to be avoided under existing flight rules.	No Change from existing conditions.	Projected effects would be spread out over a longer period of time. Ultimate impacts would be identical to that under the Realignment Action.

## **CHAPTER 3.0 - DESCRIPTION OF THE AFFECTED ENVIRONMENT**

### **3.1 LAND USE**

#### **3.1.1 Cannon AFB**

Cannon AFB is located in Curry County, NM, on the northern edge of the Southern High Plains, or Llano Estacado. The topography around the base is mostly rolling, grassy prairie without trees, rivers, or mountains. Base activities impact primarily the New Mexico counties of Curry and Roosevelt and the New Mexico cities of Clovis and Portales.

Several planning projects have been initiated for the area around Cannon AFB with funding provided by the Office of Economic Adjustment, by the Department of Defense, and by the State Department of Finance and Administration. A steering committee, titled Planning Authority for Cannon Expansion (PACE), was established to develop potential projects and allocate the \$200,000 budget. Several of the projects completed so far include the City of Clovis Planned Unit Development and Subdivision regulations, Roosevelt and Curry County recreation inventory and needs assessment, and Curry County base mapping. Projects currently underway include Comprehensive Plans for Curry County, Clovis, and Portales; Clovis construction standards; and Portales subdivision regulations.

Clovis is the county seat of Curry County. Outside the urban area of Clovis, the land is primarily used for agriculture; 49% is dry cropland, 26% is range, and 25% is irrigated cropland (Vandegrift and Associates, September 1991). The primary dry-land crops are wheat and grain sorghum. On irrigated lands the primary crops are wheat, grain sorghum, corn, potatoes, cotton, hay, barley, and peanuts. Several feed lots for cattle are scattered throughout the county. Land surrounding Cannon AFB is listed as irrigated farmland of statewide importance. There are 133,700 acres of prime farmland in Curry County (Henningston, Durham, and Richardson, Inc., 1981). Several new areas of agricultural growth, such as dairies and specialized crops, are increasing in the county.

There are four small rural communities in Curry County: Broadview, Grady, Melrose, and Texico. In the remote areas of the county, there are small clusters of homes such as Ranchvale and Bellview. Several clusters of housing and commercial developments, located on major roads, surround the urban area of Clovis. One growth area is along US Highway 60/84, which is the primary road to Cannon AFB. This growth is expected to continue in an unorganized fashion because there are no zoning regulations in place for the county. Several residences and businesses adjoin Cannon AFB. Off-base housing for military personnel is located north of the base. Table 3.1-1 gives acreage by land use for Curry County and for influence areas (Clovis, Broadview, Grady, Melrose, and Texico). Most of the land in Curry County is privately owned. Land ownership for Curry and Roosevelt counties is displayed in Table 3.1-2.

**Table 3.1-1.**  
**Acreage by Land Use for Curry County and Influence Areas**

Planning Area	Residential	Commercial	Industrial	Public Parks	Utilities	Agriculture	Clovis Urban Area	Cannon AFB	Total Acres
Curry County	2,749	34	647	36	3,124	1,011	824,822		832,423
Clovis	2,199	84	288	21	7	419	39,901	14,720	61,440
Broadview	38	8	1	2	0	1	556		606
Grady	40	4	1	17	1	1	550		614
Melrose	212	16	12	31	5	63	1,412		1,751
Texico	120	12	12	1	24	117	1,155		1,441
<b>Total</b>	<b>5,123</b>	<b>146</b>	<b>949</b>	<b>107</b>	<b>3,137</b>	<b>1,495</b>	<b>867,241</b>	<b>14,720</b>	<b>896,824</b>

Source: Vandegrift and Associates, 1991

**Table 3.1-2.**  
**Land ownership for Curry and Roosevelt Counties**

County	OWNERSHIP (ACRES)				
	Private	State	Bureau of Land Management	Other Federal	Total
<b>Curry</b>	834,031	60,667	0	3,862	<b>898,560</b>
<b>Roosevelt</b>	1,322,823	211,140	5,148	33,369	<b>1,572,480</b>
<b>TOTAL</b>	<b>2,156,854</b>	<b>271,807</b>	<b>5,148</b>	<b>37,231</b>	<b>2,471,040</b>

Source: Eastern Plains Council of Governments, 1989

The Curry County Comprehensive Plan is near completion. Public reaction to the plan has been reserved. Several years ago a zoning ordinance was presented to the county commission that was opposed by residents and resulted in the initiation of a lawsuit. A federal judge ruled that a comprehensive plan must be in place in order for a zoning ordinance to be considered. Currently, there is no strong effort to get the comprehensive plan passed by the county commission.

Cannon AFB has nearly completed an updated Air Installation Compatible Use Zone (AICUZ) land use guidelines. The AICUZ concept is designed to guide land use development in the vicinity of airfields to the mutual benefit and protection of local citizens and the air installations. The purpose of AICUZ is to delineate land use districts and guidelines of compatibility for land areas impacted by aircraft noise exposure and accident potential. These districts are divided into compatible use districts (CUDs), which are directly related to specific land use guidelines for each CUD. The AICUZ is not a regulatory document, but it does provide data helpful to local communities in managing land uses near the base.

The urban area of Clovis, NM, is approximately 6 miles to the east of the base. Clovis is a regional and service market center for east central New Mexico and western Texas. Due to the number of feed lots and processing plants in the area, Clovis is known as the "Cattle Capital of the Southwest."

Clovis is divided by the main line of the Santa Fe Railroad, which divides the residential and commercial areas to the north and industrial and manufacturing areas to the south. Like many cities, Clovis is experiencing residential and commercial growth in outlying areas away from the town's original core. New single-family dwellings have been or are being built in the northern, northeastern, and eastern sections of Clovis. In these growing areas, there are platted subdivisions that can be developed at any time. Strip commercial developments are occurring along major roads such as Prince Street. These new developments have resulted in a decline in commercial activities in the city's core and an increase in the number of homes in the central part of the town that are deteriorating and depreciating in value. While the existing infrastructure is being underutilized, new infrastructure needs to be extended to the developing areas. Land uses for Clovis are displayed in Table 3.1-1.

One method in which off-base military family housing is provided to personnel is through a federal program known as "801 Housing." Under this program, the Air Force contracts with a private entity to build housing to meet military family housing requirements. In return for an annual lease payment, the private entity turns the development over to the Air Force for use, usually for a lease period of 20 years. Two 801 Housing Developments are being constructed to support this action: 200 units in Clovis and 150 units in Portales.

Clovis has an active zoning ordinance and has recently passed new subdivision and planned unit development regulations. Currently, the Clovis Comprehensive Plan is being updated. A state statute enables a city to expand

its authority for zoning regulations for 5 miles and for subdivision regulations for 3 miles. Cannon AFB would be included in the zoning planning boundary 5 mile extension. However, Clovis has not set up an extraterritorial committee to enforce the regulations. Therefore, the growth on U.S. Highway 60/84 is not zoned and is currently under the county's jurisdiction.

Roosevelt County is south of Cannon AFB. Like Curry County, most of the area is used for agricultural purposes on a mixture of irrigated and dry cropland and grazing land. With four peanut processing plants in Portales, peanuts are a primary commodity. Other crops grown in the county are wheat, milo, corn, cotton, and Irish potatoes. Roosevelt County also has the largest dairy industry in New Mexico and a strong beef cattle industry.

In addition to Portales, the county seat, there are several small rural communities in Roosevelt County. A Santa Fe rail line follows US Highway 70 through the county, and Oasis State Park is located between Portales and Cannon AFB on State Highway 467. The park offers fishing, hiking, picnicking, camping, and playing areas on 193 acres. Approximately 60,000 people visit the park annually. Grulla National Wildlife Refuge (NWR), used primarily as a wildlife sanctuary, covers 3,236 acres. Grulla has a few hiking trails, and sandhill cranes come to the area for the winter. The majority of the land in Roosevelt County is privately owned (see Table 3.1-2). There is neither zoning nor a comprehensive plan for the county.

Portales is 19 miles south of Clovis and is home to the main campus of Eastern New Mexico University (ENMU), the third largest university in the state. The main part of the city contains a mixture of recreational and commercial land uses. An industrial park, a recreation complex, and country club estates are located in the western part of the city.

Portales has an active zoning ordinance and the city's comprehensive plan is currently being updated. The recent widening and resurfacing of State Highway 467 and a toll free line to Cannon AFB have made living in Portales more attractive to USAF personnel. There is no toll free line between Portales and Clovis. Portales also has an approved 150-unit 801 Housing development. There are several subdivisions in Portales available for development. The city's infrastructure is able to handle current and future needs.

The Eastern Plains Council of Governments (EPCOG) is a voluntary association of county and municipal governments within the seven-county area of Planning and Development District IV, which includes Curry and Roosevelt counties. The primary function of EPCOG is to provide technical assistance in developing and implementing priority local programs and projects. EPCOG is currently working on a regional water plan, housing-related issues, and a solid waste plan.

### 3.1.2 Affected MTRs

Most of the affected MTRs (IR-107, IR-110, IR-111, IR-113, VR-100, VR-108, VR-114, and VR-125) are located over land used for agricultural purposes, primarily cattle grazing. There are scattered irrigated and dryland crop-growing lands throughout the area. The average farm size in the counties below the MTRs is over 1,000 acres, creating a sparsely populated area. Small towns scattered throughout the area offer household goods and agricultural support products. IR-109 is located over land that is used for a mixture of cattle grazing, crop growing, and timbering and overlies major ski areas in the vicinity of Taos, NM. IR-112 is located over McKinley County, NM, and several northeastern Arizona counties. The high desert area beneath IR-112 is primarily open expanse with some scattered agricultural activities. IR-112 lies above the Navajo and the Hopi Indian Reservations and near the Zuni Indian Reservation. VR-100 and VR-125 lie above Sumner Lake State Park, Bitter Lake NWR, the Cibola and Lincoln National Forests, and Gran Quivira Unit of Salinas Pueblo Missions National Monument.

The Sumner Lake State Park is used for camping and picnicking and is located on a reservoir used for boating, water skiing, swimming, and fishing. A boat ramp and marina are located on the lake. Bitter Lake NWR has a large concentration of waterfowl.

IR-113, VR-100, and VR-125 are located over the Mountainair Ranger District of the Cibola National Forest. The main activities in this area include camping at a 5-site campground and hunting. These routes are also over the Smoky Bear Ranger District in the Lincoln National Forest. Included in this area is the Capitan Mountains Wilderness Area, founded in 1950. The main activities in this district include snow skiing, camping, picnicking, hunting, fishing, and hiking.

Salinas Pueblo Missions National Monument consists of three sites in central New Mexico; the Abo, Quarai, and Gran Quivira units. The Abo and Quarai units feature the remains of Spanish mission churches dating from the 1600s, constructed in red sandstone. They are associated with unexcavated Pueblo Indian ruins. The Gran Quivira unit is distinguished by its Spanish mission church, also built in the 1600s, constructed in blue-gray limestone. This unit also has a large portion of excavated Pueblo Indian ruins. Activities at all locations include visiting the Visitor's Center, self-guided trail tours, and picnicking. The Quarai and Gran Quivira units also have small museums exhibiting Indian artifacts. The sites are open from 8:30 a.m. to 5:00 p.m. daily. Figure 3.1-1 shows the location of these units and other features of interest, with respect to the affected MTRs.

VR-114 is located in western Texas and eastern New Mexico. No recreational areas are located near this MTR. IR-107 and VR-108 are located over the Kiowa National Grasslands. IR-109 is located near the Cimarron Canyon State Park. The main recreational activities at this park are camping, fishing, hunting, back

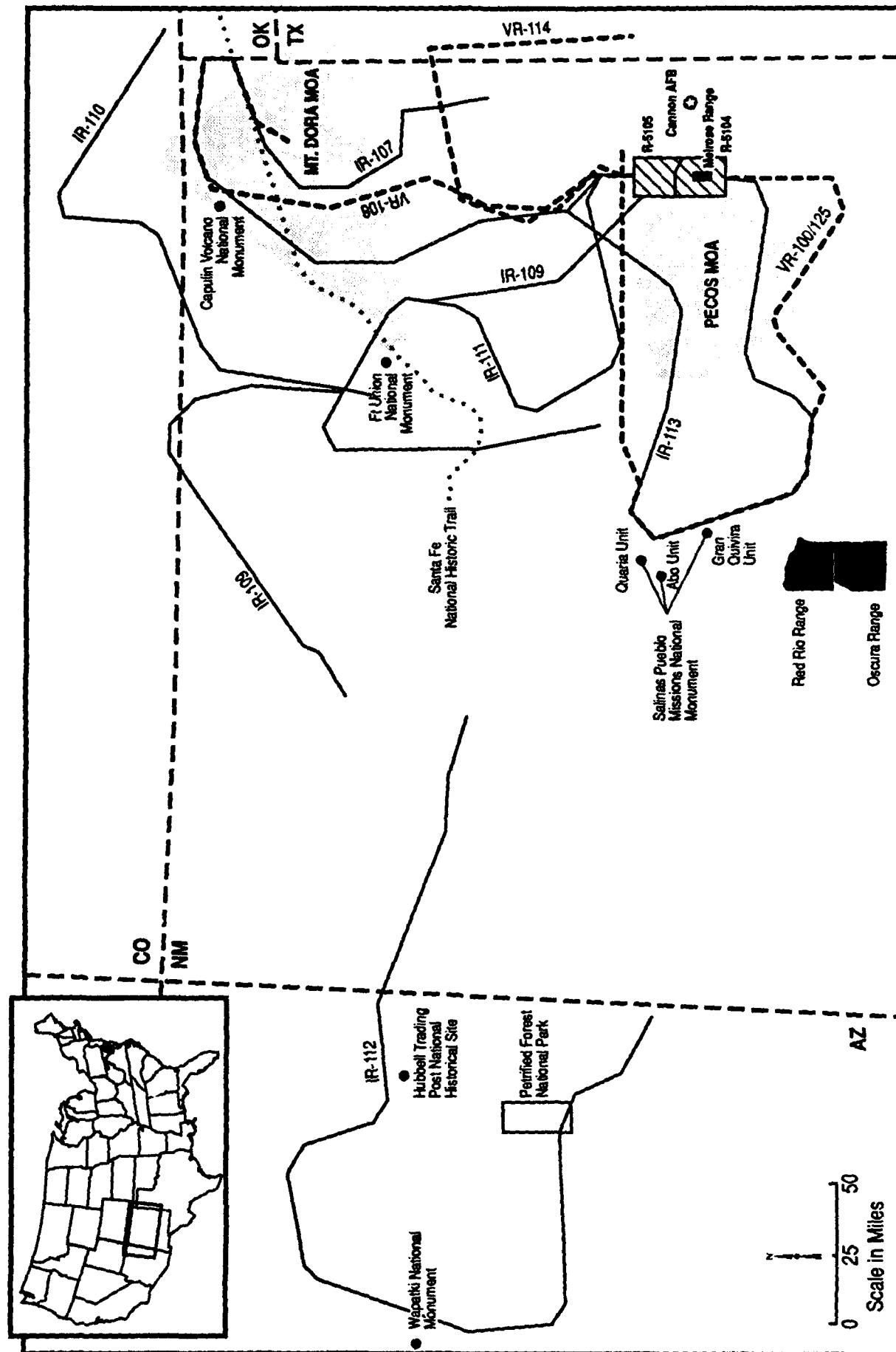


Figure 3.1-1. Affected Airspace in Relation to Cannon AFB and National Monuments and Parks.

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country hiking, rock climbing, and picnicking. This MTR also lies over the Valle Videl and Tres Piedras Ranger District of Carson National Forest, the northern section of the Sante Fe National Forest, and the Chama Wilderness Area in the Santa Fe National Forest. IR-110 lies near Cimarron State Park and Coyote Creek State Park in New Mexico and the Trinidad State Recreation Area and Comanche National Grassland in Colorado.

IR-111 lies over two national forests, a wilderness area, and a state park. The route is over the southern section of the Camino Real Ranger District in the Carson National Forest. Several campgrounds, ranging from 2 to 29 campsites, are located in this area. Other recreational activities in the area include hiking, fishing, mountain cycling, hunting, snow skiing, snowshoeing, and snowmobiling. IR-111 is also over the Pecos Ranger District of the Santa Fe National Forest. The route lies over several campgrounds ranging in size from 3 to 75 campsites. Other activities in this district are the same as those described for the Carson National Forest. In addition to recreational uses, portions of the national forests are used for timbering operations and cattle grazing.

The Pecos Wilderness Area is located in both the Carson and Santa Fe National Forests. The Wilderness Area was established in 1955 and was recognized by Congress under the Wilderness Act of 1964. The main activities in the area include camping, hiking, fishing, picnicking, cross-country skiing, and snowshoeing.

IR-111 is also over the Coyote Creek State Park. The main activities at the park are camping, picnicking, hiking, and fishing.

IR-112 lies over the Cibola Forest and Red Rock State Park in New Mexico, and the Petrified Forest National Park and Wupatki National Monument in Arizona.

### **3.1.3. Melrose Range Land Use**

Currently there are 73,908 acres in the Melrose Bombing Range. USAF leases approximately 50,800 acres to various individuals who primarily use the area for cattle grazing. Limited dryland crop growing occurs in the northern section of the Range. USAF wants to convert all cropland to grassland in the next 5 to 10 years. Approximately 1,497 acres were given a restrictive easement, which means that USAF purchased minimal rights with the intent of limiting use of the property to cattle grazing or gas/oil exploration or extraction. In addition, structures are limited to 100 feet in height and to minimal building for cattle grazing, farming, and mineral exploration/extraction activities. Figure 3.1-2 displays the areas of the Range that are owned by USAF and the areas that are under a restrictive easement.

The Melrose Range was expanded by 55,000 acres in 1986. Of the 55,000 acres added to the Range, 16,040 acres were owned by the State of New Mexico, 48 acres were owned by the Bureau of Land Management, and 38,912

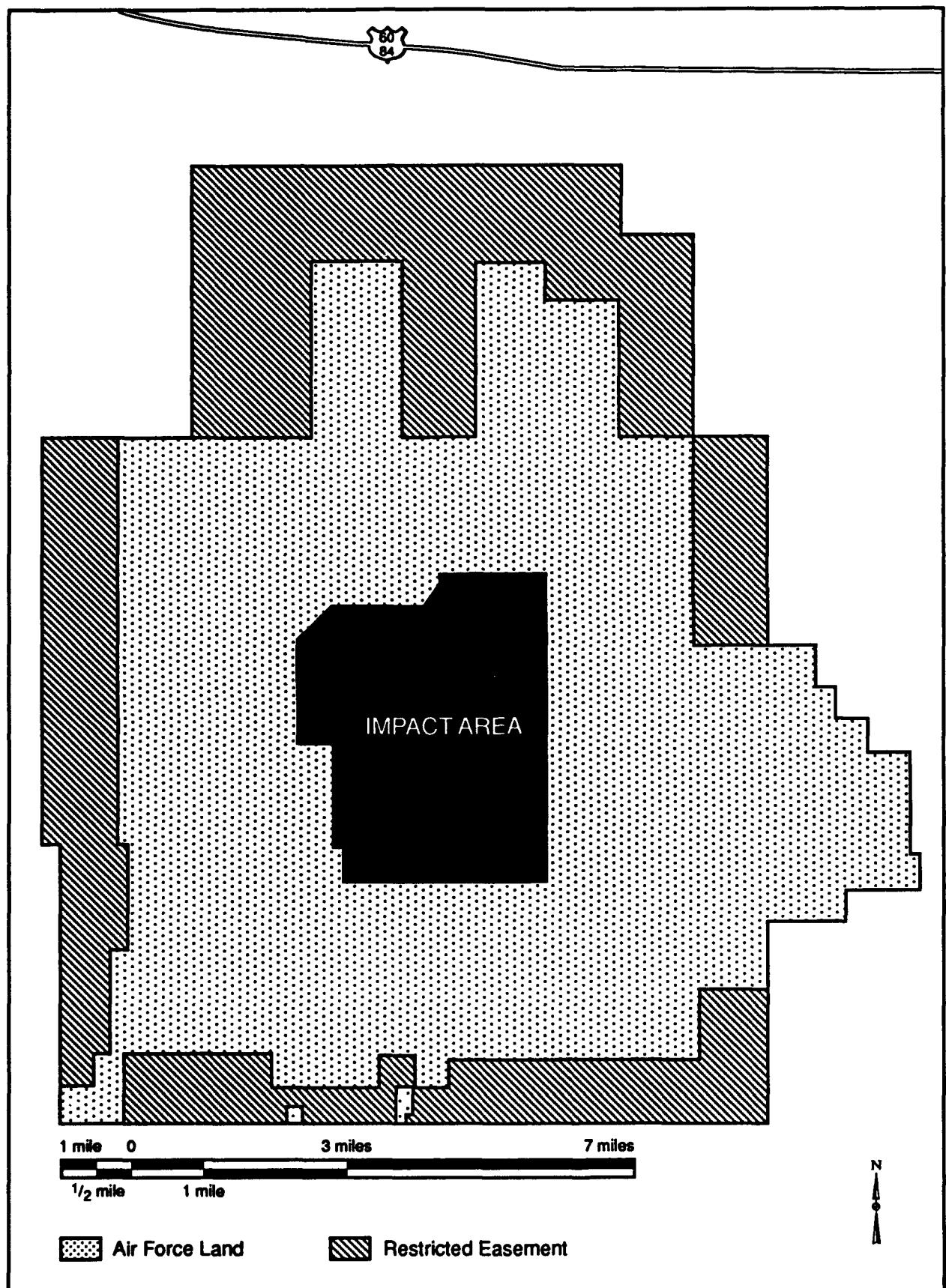


Figure 3.1-2 Melrose Bombing Range

acres were privately owned. When the 55,000 acres were added to the Range, 27,760 acres were purchased outright (23,280 acres privately owned, 4,480 acres state owned).

Table 3.1-3 shows a breakdown of agricultural activities in the expansion area before the land was added to the Range. A support facility near the center of the Range houses a fire station, maintenance area, TV camera station for monitoring ordnance practices, and other support facilities.

Most of the land surrounding the Range is used for agricultural purposes, primarily cattle grazing and crop growing. The majority of crop growing is east of the Range. The small community of Taiban and several scattered residences are located under the area that is subject to noise.

### **3.1.4 Red Rio Bombing Range**

The Red Rio Bombing Range is located in the northeast section of the White Sands Missile Range (WSMR). Highway 380 is north of both Ranges. The area is primarily high desert open space. This bombing range is inaccessible to the public and has no residential structures.

Valley of Fires State Park is east of Red Rio. The park contains one of the youngest lava fields in the United States and has camping, nature trails, and picnicking. The "Trinity Site," where the world's first atomic bomb was exploded, is west of the bombing ranges and is closed to the public.

### **3.1.5 Oscura Bombing Range**

The Oscura Bombing Range is located in the northeast corner of the WSMR, due south of the Red Rio Bombing Range. Highway 54 is east of this Range. The area is primarily high desert open space. Oscura is inaccessible to the public and has no residential structures. Valley of Fires State Park and the Trinity Site are located near the Range.

### **3.1.6 Mount Dora Land Use**

Mount Dora MOA overlies portions of Colfax, Harding, Mora, and Union counties in New Mexico, and small portions of Dallam County, TX, and Las Animas County, CO. Most of the land in the affected area is privately owned; however, the three states own school lands and state parks. The school lands are several parcels of land leased for various activities to generate income for the states' educational systems. The federal government owns land for the Kiowa National Grassland and Capulin Volcano National Monument. There are no Native American-owned lands under the MOA.

Land underlying the MOA is used mainly for agricultural purposes, primarily cattle grazing. Raising cattle is the main economic activity in the area. There are also dryland and irrigated crops growing in the affected area, but these crop activities represent a smaller percentage of the value of agricultural

**Table 3.1-3. Agricultural Activities  
In Melrose Bombing Range Expansion Area  
Before the Land Was Added to the Range**

	Curry County Acres	Roosevelt County Acres
Dryland Farming	0	2,500
Irrigated Farming	640	2,860
Private Rangeland	878	36,622
Lease Rangeland (state)	3,680	7,820
<b>Total</b>	<b>5,198</b>	<b>49,802</b>

products sold (Table 3.1-4). The amount of acreage used for crop growing is significantly less than that used for cattle grazing. The principal crops grown are wheat, grain sorghum, corn, peanuts, cotton and cottonseed, barley, potatoes, and alfalfa. The average acreage per farm in the affected counties ranges from 1,981 acres in Dallam County, TX, to 6,241 acres in Harding County, NM (U.S. Bureau of the Census, 1989). Since the farms are so large, the counties are sparsely populated, with scattered residential developments. The largest town under the MOA is Clayton, NM. Several small towns scattered throughout the area provide household goods and agricultural support products. Formal land use planning and zoning are not actively pursued by the local county governments in the affected area.

In addition to farming and small towns, there are two state parks, one national grassland, one national monument, and one national historic trail in the affected area. Table 3.1-5 displays visitation figures for these recreation areas.

Clayton Lake State Park has 417 acres with a 170-acre lake. Camping is permitted only at a 40-site campground. Fishing is permitted from May to September; no hunting is allowed. There is a 1/2-mile trail to dinosaur tracks. The area is a winter nesting site for birds. Chicosa Lake State Park has 620 acres with a 26-acre lake. The lake is sometimes dry due to insufficient rainfall. There is a designated 14-site campground, and camping is permitted anywhere along a road that circles the lake. Fishing is permitted year round; hunting is not allowed.

The Kiowa National Grasslands is divided into two areas, one located in Union County (Union Unit) and the other in Harding County (Mills Unit). The Union Unit covers 57,542 acres, and hunting is the primary recreational activity. The Mills Unit, through which the Canadian River runs, covers 70,500 acres. There is an 8-site campground in Mills Canyon that has a primitive access road, and hunting and fishing are permitted in the area. The hunting season generally runs from mid-September to December and is governed by the New Mexico Department of Game and Fish. There are no restrictions on hiking or camping in the grasslands.

The Capulin Volcano National Monument is a volcanic crater that covers 790 acres. The main activities at the Monument are geological interpretation, viewing the scenery, walking, and picnicking (15 tables). There is a nature trail at the monument's Visitor Center. A bill is currently before Congress to authorize a study of expanding the monument by approximately 10,000 acres. The expansion would be primarily west of the existing site.

The Santa Fe Trail is a designated unit of the National Trails System and is administered by the National Park Service in cooperation with private landowners, groups, and governmental entities. The trail runs from Santa Fe, NM, to Old Franklin, MO. The trail branches near Springer, NM, and the Cimarron cut-off trail extends through the MOA. The National Park Service has put out a draft comprehensive management and use plan for the trail. Most of the trail is on private land, so a cooperative agreement with landowners will be

**Table 3.1-4. Percentage of the Value of Agricultural Products Sold in the Counties Under the Mount Dora MOA, 1987**

	Farms (Number)	Farms With Cattle (Number)	Share of Farms in Ranches (%)	Land In Farms (Acres)	Approximate Land Area (Acres)	Share of Land in Farms (%)
Colfax, NM	303	227	74.9%	1,877,995	2,407,891	78.0%
Dallam, TX	397	267	67.3%	786,393	963,488	81.6%
Harding, NM	181	159	87.8%	1,129,548	1,358,252	83.2%
Las Animas, CO	481	391	81.3%	2,149,828	3,053,190	70.4%
Mora, NM	401	325	81.0%	950,958	1,234,988	77.0%
Union, NM <sup>1</sup>	438	347	79.2%	2,451,219	2,451,219	100.0%
<b>Six-County Total</b>	<b>2,201</b>	<b>1,716</b>	<b>78.0%</b>	<b>9,345,941</b>	<b>11,469,028</b>	<b>81.5%</b>
<b>Estimated Total Under Mt. Dora MOA<sup>2</sup></b>	<b>632</b>	<b>499</b>	<b>79.0%</b>	<b>3,008,773</b>	<b>3,313,980</b>	<b>90.8%</b>

<sup>1</sup> The Census can report figures for Land in Farms greater than the Approximate Land Area. Land in each farm was tabulated as being in the operator's principal county, i.e., the county where the largest value of agricultural products was raised or produced. In counties such as Union, where farms extend over several counties, this procedure has resulted in the allocation of more land in farms to a county than the total land area of the county. Therefore, an adjustment to the Land in Farms is made for Union county, setting it equal to approximate land area rather than the reported value of 2,603,803. If the reported value were used, the estimated share of land in farms under the Mount Dora MOA would be biased upward.

<sup>2</sup> Calculated as the weighted sum of the six counties, assuming the following share of each county is included in the MOA: Colfax NM - 15 percent; Dallam, TX - 15 percent; Harding, NM - 50 percent; Las Animas, CO - 2 percent; Mora, NM - 25 percent; Union, NM - 75 percent.

Source: U.S. Bureau of the Census, Census of Agriculture, 1987, for Colorado, New Mexico, and Texas.

**Table 3.1-5. Visitation at State and National Parks Located  
in the Area Under the Mount Dora MOA**

<b>Park</b>	<b>Visits, 1987</b>	<b>Visits, 1988</b>
Chicosa Lake State Park	6,381	11,302 <sup>1</sup>
Clayton Lake State Park	8,556	44,824 <sup>1</sup>
Kiowa National Grasslands	N/A	5,600 <sup>2</sup>
Capulin Mountain Natl. Mon.	38,849 <sup>3</sup>	53,427

<sup>1</sup> Lower visitation occurred in 1987 because of drought conditions at the lake.

<sup>2</sup> Approximately 4,300 visits occurred during hunting season (September-December).

<sup>3</sup> Low visitation in 1987 was due to road construction.

**Sources:** Carlos Valdez, Regional Mgr., New Mexico State Parks  
Ralph Harris, Superintendent, Capulin Mountain National Monument  
Allen Hinds, Cibola National Forest

needed to allow public access to parts of the trail. Future plans include hiking on part of the trail, interpretive stations, and an auto tour route that generally follows the trail.

### **3.1.7 Pecos MOAs**

This group of MOAs, located west of R-5104 and R-5105, overlies grazing land between Santa Rosa to the north and Roswell to the south. The Pecos East Low MOA has a floor of 1,500 feet AGL over the town of Ft. Sumner. The Bitter Lake NWR and Salt Creek Wilderness Area lie just outside the MOA to the south.

## **3.2. AIR QUALITY**

### **3.2.1 Cannon AFB**

Curry County, where Cannon AFB is located, is within the Pecos-Permian Basin Interstate Air Quality Control Region (AQCR), which is listed in 40 CFR Part 81 as being either in attainment with or unclassified for all National Ambient Air Quality Standards (NAAQS). These standards are listed in Table 3.2-1. The Pecos-Permian Basin Interstate AQCR consists of the following counties within the State of New Mexico: Chaves, Curry, De Baca, Eddy, Lea, Quay, and Roosevelt. There are no Federal Mandatory PSD (Prevention of Significant Deterioration) Class I Areas located in the vicinity of Cannon AFB (PSD Class I areas are given special protection in the Federal Clean Air Act by the Class I "increments": very restrictive, maximum allowable increases of air pollution in the ambient air of the Class I areas). The Salt Creek Wilderness Area, approximately 90 miles to the southwest, is the nearest Class I Area to Cannon AFB.

Curry County is currently listed as being in attainment with all NAAQS and New Mexico Ambient Air Quality Standards (NMAAQS). According to New Mexico Bureau of Air Quality staff (Baker, 1991), there is a potential for some of the other counties in the AQCR to be designated as being in non-attainment for NO<sub>x</sub>, primarily due to emissions from oil and gas development operations. The oil and gas development is concentrated in Lea and Eddy Counties, which are located a minimum of 50 miles south of Cannon AFB.

The New Mexico State Air Quality Improvement Board maintained a monitoring station for Total Suspended Particulates (TSP) in the town of Clovis, which lies approximately 7 miles east of Cannon AFB. This station was shut down at the end of 1988, but had not measured exceedances of the NAAQS or NMAAQS for at least the previous 4 years. No other air quality data have been measured recently within 100 miles of Cannon AFB. Current Cannon AFB air pollution loading consists of emissions from the following sources:

- aircraft ground operations
- heating and power production
- fuel storage, transfers, and spills

**Table 3.2-1 Federal and State Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Standard</b>	
		<b>State</b>	<b>Federal</b>
<b>Total Suspended</b>	24-hr primary	none	260(ug/m <sup>3</sup> )
	24-hr secondary	150(ug/m <sup>3</sup> )	150(ug/m <sup>3</sup> )
	Annual Arithmetic Mean		
	Primary	none	75(ug/m <sup>3</sup> )
<b>PM<sub>10</sub></b>	Secondary	60(ug/m <sup>3</sup> )	60(ug/m <sup>3</sup> )
	24-hr primary	150(ug/m <sup>3</sup> )	150(ug/m <sup>3</sup> )
	24-hr secondary	150(ug/m <sup>3</sup> )	150(ug/m <sup>3</sup> )
	Annual Arithmetic Mean		
<b>Ozone</b>	Primary	50(ug/m <sup>3</sup> )	50(ug/m <sup>3</sup> )
	Secondary	50(ug/m <sup>3</sup> )	50(ug/m <sup>3</sup> )
	1-hr	0.06 ppm 118 ug/m <sup>3</sup>	0.12 ppm 240 ug/m <sup>3</sup>
<b>SO<sub>2</sub></b>	24-hr	0.10 ppm 265 ug/m <sup>3</sup>	0.14 ppm 365 ug/m <sup>3</sup>
	3-hr	none	0.50 ppm 1300 ug/m <sup>3</sup>
	Annual Arithmetic Mean	0.02 ppm 55 ug/m <sup>3</sup>	0.03 ppm 80 ug/m <sup>3</sup>
<b>NO<sub>2</sub></b>	24-hr	0.10 ppm 200 ug/m <sup>3</sup>	none
	Annual Arithmetic Mean	0.05 ppm 100 ug/m <sup>3</sup>	0.05 ppm 100 ug/m <sup>3</sup>
<b>CO</b>	8-hr	8.7 ppm 9.7 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
	1-hr	13.1 ppm 15 mg/m <sup>3</sup>	35 ppm 40 mg/m <sup>3</sup>

**Notes:**

(1) A NAAQS exists for lead; however, there are no known significant sources of lead emissions in this region and lead emissions from Base activities are expected to be insignificant.

(2) EPA replaced the TSP NAAQS with a PM-10 (particulate matter less than 10 microns in diameter) standard in July 1988. The TSP standard is referenced here because no monitoring data for PM-10 is available. Also, emissions calculations are based on engineering factors which were formulated for TSP emissions and may not be valid for PM-10 emissions calculations.

- surface coating
- fire fighting training
- aircraft flying operations
- auxiliary ground equipment (AGE)
- diesel fuel combustion
- motor vehicles

Baseline emission estimates for Cannon AFB were developed earlier for the realignment Environmental Impact Statement (EIS) (TAC, 1990). However, an increase in the number of planes and personnel based at Cannon AFB has resulted in higher levels of baseline air emissions. Therefore, to reflect the increased activity, the previous estimates were revised as follows:

1. Increases in emissions from aircraft ground support activities, including routine maintenance, machining, surface coating, refurbishing, AGE testing, and fuel storage/handling, were estimated by using a ratio of the number of incoming F-111s to the current number of F-111s.
2. Increases in emissions from aircraft flying operations and AGE were estimated by determining the increase in the number of aircraft sorties.
3. Increases in vehicular emissions and heating and power production were estimated by determining the increase in personnel at the Base.

These emissions are summarized in Table 3.2-2. The table also shows the percent increase in emissions from the 1990 EIS. These estimated increases in emissions over the earlier baseline emissions range from 36 to 42 percent. These increases are approximately one-half of the estimated increase in emissions (66 to 78 percent) of the proposed action in the 1990 EIS.

### **3.2.2 MTRs**

There are a total of 10 MTRs associated with the MOAs and Ranges that will be affected by the proposed action. They are IR-107, IR-109, IR-110, IR-111, IR-112, IR-113, VR-100, VR-108, VR-114, and VR-125. These 10 MTRs are situated principally in New Mexico, but also cover parts of Arizona, Colorado, Oklahoma, and Texas.

The attainment status of these MTRs was determined by contacting the appropriate state agencies responsible for regulating air quality in the five states (Oklahoma, Air Quality Service; Arizona, Office of Air Quality; New Mexico, Bureau of Air Quality; Colorado, Air Pollution Control Division; Texas, Air Control Board). All the land underlying these MTRs is classified by the appropriate agencies as in attainment of the federal and state ambient air quality standards.

Table 3.2-2 1991 Baseline Cannon AFB Air Emissions Inventory

STATIONARY SOURCES	Activity	POLLUTANT TONS/YEAR				
		HC	CO (Non-Methane)	NOX	PART	SOX
Aircraft Ground Operation		21.7	6.92	15.0	0.81	3.49
Heating & Power Production	13.34	1.16	65.0	0.96	0.86	
Fuel Storage, Transfers and Spill	--	77.4	--	--	--	--
Spill	--	20.0	--	--	--	--
Fire Fighting Training	11.9	6.81	0.09	2.72	0.09	
<b>SUBTOTAL</b>	<b>46.9</b>	<b>112</b>	<b>80.1</b>	<b>4.49</b>	<b>4.44</b>	
3 NON-STATIONARY SOURCES						
ACTIVITY						
Aircraft Flying Operations	628	219	219	3.29	29.9	
AGE Emissions	60.8	9.21	116	8.29	1.67	
Diesel Fuel Combustion	18.0	2.88	13.1	0.82	1.76	
Motor Vehicles	535	57.9	57.4	7.6	2.32	
<b>SUBTOTAL</b>	<b>1242</b>	<b>289</b>	<b>406</b>	<b>20.0</b>	<b>35.7</b>	
<b>TOTAL</b>	<b>1289</b>	<b>401</b>	<b>486</b>	<b>24.5</b>	<b>40.1</b>	
Percent increase from baseline emissions in Cannon AFB EIS (1990)		42%	36%	40%	40%	36%

Three of these MTRs pass over mandatory PSD Class I areas: IR-109, San Pedro Parks Wilderness Area; IR-111, Pecos Wilderness Area; and IR-112, Petrified Forest National Park.

### **3.2.3 Melrose, Oscura, and Red Rio Ranges**

Three Ranges are included in the proposed action: the Melrose Range, the Red Rio Range, and the Oscura Range. All three are in attainment areas located in New Mexico. The Melrose Range is approximately 30 miles west of Cannon AFB and is situated on the northeast side of the Pecos MOA. The Red Rio and Oscura Ranges are both adjacent to the WSMR, approximately 170 miles southwest of Cannon AFB.

The Salt Creek Wilderness Area is the PSD Class I area nearest to the Melrose Range and is located approximately 50 miles southwest. The White Mountains Wilderness Area is the PSD Class I area nearest to the Red Rio and Oscura Ranges and is located 15 miles east of the Ranges.

### **3.2.4 Mount Dora and Pecos MOAs**

There are two MOAs involved in the proposed action: the Mount Dora MOA and the Pecos MOA. The Mount Dora MOA is located primarily within New Mexico, with small sections (less than 10 percent) situated in Texas and Colorado. Mount Dora MOA is approximately 110 miles north of Cannon AFB. The Pecos MOA is located entirely within the state of New Mexico, approximately 35 miles due west of Cannon AFB.

The attainment status of these two MOAs was determined by contacting the appropriate state agencies responsible for regulating air quality in the three states (New Mexico, Bureau of Air Quality; Colorado, Air Pollution Control Division; Texas, Air Control Board). Both the Mount Dora and Pecos MOAs are located in areas that are in attainment with both the NAAQS and the state ambient air quality standards.

The Mount Dora MOA is located approximately 20 miles east of the boundary of the Pecos Wilderness Area, a mandatory PSD Class I Area. The southern boundary of the Pecos MOA is located just outside of the Salt Creek Wilderness Area, another PSD Class I wilderness area.

## **3.3 NOISE**

### **3.3.1 Introduction**

This section reviews the noise metrics and the methods used to assess noise exposure around airbases, MTRs, MOAs, and Ranges. Section 3.3.2 contains a description of the metrics and the meaning and interpretation of noise levels. Included in Section 3.3.2 are descriptions of the effects of noise on community

annoyance, hearing loss, speech interference, and sleep disturbance. Sections 3.3.3 through 3.3.6 contain an assessment of the existing noise environment at Cannon AFB and the impacted MOAs, MTRs, and Ranges. The effect of the proposed action on this noise environment is discussed in Section 4.1.3.

### **3.3.2 Description and Impact of Environmental Noise**

#### **3.3.2.1 Descriptors of Environmental Noise**

The evaluation of aircraft noise requires descriptions of the noise associated with individual aircraft flyovers, and also of the cumulative effect of a number of events which occur over some period of time. In this study, individual noise events are described by their A-weighted sound level and their sound exposure level (SEL). The cumulative effect of noise is described by the day-night average sound level,  $L_{DN}$ . Because  $L_{DN}$  is a composite which accounts for the amplitude of individual events, the number of events, and the time of day of their occurrence, it is used as the primary descriptor of noise impact. Single event levels are included in this study as a supplemental description.

The A-weighted sound level is the instantaneous measure of sound amplitude. The sound is passed through an A-weighting filter, which approximates the frequency response of the human ear. A-weighted sound levels correlate well with how loud people perceive a sound to be. A-weighted sounds are generally averaged over a short time period, either 1/8 second ("fast" response) or 1 second ("slow" response). Fast response is appropriate when measuring the maximum level ( $L_{MAX}$ ) from rapidly changing sounds such as aircraft flyovers.

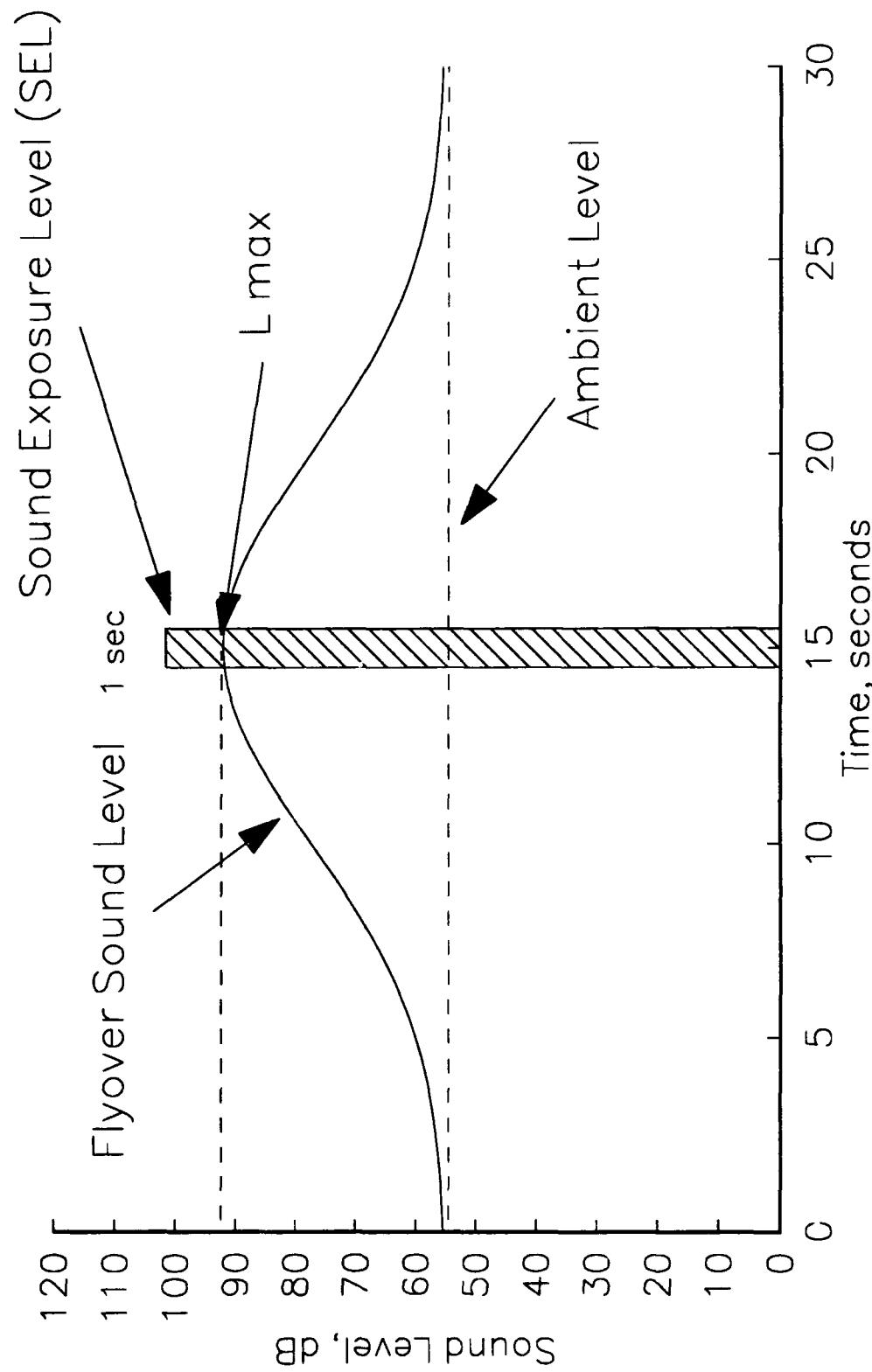
The intrusiveness of a sound depends on how high the level is and on how long it lasts. A measure of the combined effect of level and duration is the sound exposure level (SEL). This is the level of a one-second sound which has the same acoustic energy as the actual sound event, illustrated in Figure 3.3-1. Shown are the sound level of an aircraft flyover, which varies with time, and the SEL. Because SEL accounts for the duration of an event, as well as its level, it is a much better descriptor of individual events than  $L_{MAX}$ .

Over a period of time, intrusiveness of noise depends on the number of events as well as the nature of each. The combination of events over time is represented by the equivalent-continuous average,  $L_{EQ}$ . This is a level which, if continuous over the period represented, has the same total acoustic energy as the total of the actual noise events.

Because noise tends to be more intrusive at night than during the day, a 10 dB penalty is assigned to events between 10:00 p.m. and 7:00 a.m. The average level, incorporating this penalty, is the day-night average sound level ( $L_{DN}$ ). When computing  $L_{DN}$  for a particular situation, the averaging period should be identified. Around civil airports, where operations are fairly consistent over time, a one year period is used. Around military airbases, where activity can vary,  $L_{DN}$  is computed for an average busy day. This yields higher levels than an annual average, but is a fairer representation of the impact which occurs during active

**Figure 3.3-1. Comparison of Measurements Used to Describe Aircraft Flyovers.**

Comparison of Measurements Used to Describe Aircraft Flyovers



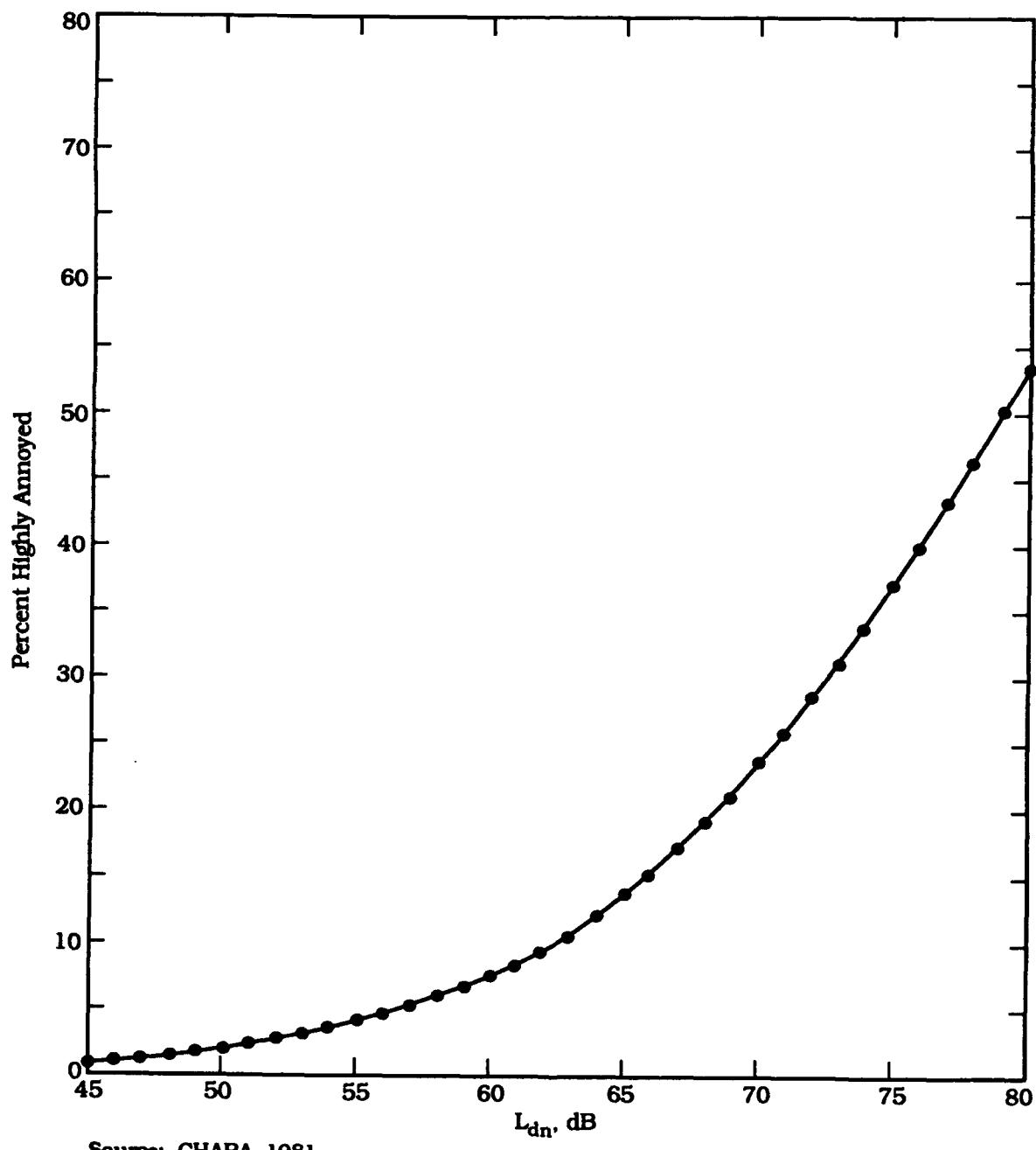
periods. The Ldn symbol is sometimes appended to denote the averaging period, such as Ldny for yearly average, but this is not necessary if the period is clear from the context.

The Ldn metric has been established by various government agencies to be a good descriptor of the impact of noise on communities (EPA, 1974; "Guidelines for Preparing Environmental Impact Statements on Noise," 1977; HQ, USAF/LEEVX, 1984; "Guidelines for Considering Noise in Land-Use Planning and Control," 1980). The primary adverse effect of noise is annoyance of people exposed to it. Figure 3.3-2 shows a widely accepted relationship between Ldn and the percent of the population expected to be highly annoyed. Annoyance is discussed in Section 3.3.2.2. Annoyance tends to be caused by noise intruding on activities, in particular speech (including listening to radio or television) and sleep; these effects are implicit in the studies of annoyance which are summarized here. Other potential adverse effects of noise are hearing loss and possible health effects. These are discussed in Sections 3.3.2.3 and 3.3.2.4. Overall guidelines are summarized in Section 3.3.2.5.

The Ldn metric, the data presented in Figure 3.3-2, and the guidelines discussed in 3.3.2.5 are heavily based on experience around airports and airbases. The noise environment within MTRs, restricted areas, or MOAs is somewhat different, in that events occur sporadically. To account for the sporadic nature of operations, Ldn in these situations is computed for the busiest month of the year, denoted Ldnm. This is a simple extension of the average busy day concept used around airbases. Additionally, individual noise events on MTRs are frequently generated by aircraft flying at low altitude and high airspeed. This type of event has a much higher onset rate than noise events around airbases, and can be more annoying because high noise levels can occur with little or no warning. To account for this increased annoyance along MTRs, the Air Force has developed an onset-rate-adjusted SEL (denoted SEL<sub>r</sub>) (Plotkin, Sutherland, and Molino, 1987). This adjustment can be up to 5 dB. When incorporated into Ldn, the noise metric used on MTRs is denoted Ldnmr.

### 3.3.2.2 Annoyance

Individual response to noise is subject to considerable variability. Noise levels necessary to cause annoyance within a given group of people can vary by as much as 40 dB (Molino, 1979). Accordingly, annoyance is treated in a statistical manner. The data shown in Figure 3.3-2 is based on an analysis of a large number of community noise surveys (Schultz, 1978). These data can be interpreted as the percent of people who will be highly annoyed, or as the probability that an individual will be annoyed. It should also be noted that these data generally represent populations that have been exposed to noise for some time. It can be expected that increasing noise in a previously quiet area can cause adverse impacts greater than might be predicted from this curve. Accordingly, adverse impact is assessed in terms of a) absolute annoyance as predicted from Figure 3.3-2, and b) the difference between Ldn before and after the action.



**Figure 3.3-2 Relationship Between  $L_{dn}$  Values and Percent of Exposed People Who are Expected to be "Highly Annoyed"**

Referring to Figure 3.3-2, the following points may be noted:

- Ldn 55 was identified in EPA, 1974 as a threshold below which no adverse impact would be expected. The percent highly annoyed is less than 5 percent. Considering the variability in annoyance, it is reasonable to consider that impact below 55 dB is negligible.
- At Ldn 65, 15 percent of the exposed population will be highly annoyed. Even considering the variability, it is clear that a larger number of people would be adversely affected. This level is considered by most agencies to be the threshold of significant adverse impact and is the level at which these adverse effects are investigated.
- Above Ldn 75, 40 percent or more of the population will be annoyed. This is clearly a severe impact and is generally not considered to be acceptable without mitigating circumstances.

When quantifying noise annoyance from a particular action, the numbers of people exposed to various levels can be multiplied by the percentage in Figure 3.3-2. This yields the total number of people expected to be highly annoyed. This is the approach used in the current study, for situations where the only adverse impact is expected to be annoyance.

### 3.3.2.3 Hearing Loss

Noise-induced hearing loss has been studied extensively, and several predictive indices have been developed. Hearing loss is generally quantified in terms of "threshold shift" that is, the difference between a person's threshold of hearing measured before and after exposure to noise. If the ear recovers completely after the noise exposure, the shift is denoted as temporary threshold shift (TTS). If the ear is damaged and cannot recover completely, the shift is permanent and denoted as permanent threshold shift (PTS).

Noise levels in populated areas for the proposed action will not exceed Ldn 75 dB. Using the guidelines recommended in CHABA (1977), long-term PTS for individuals exposed to Ldn 75 dB, outdoors, would average less than 1 dB. This calculation is based on an average daily outdoor exposure of 16 hours over a 40 year period. Changes in hearing levels of less than 5 dB are not considered to be significant (EPA, 1974). Therefore, in areas where Ldn is below 75 dB, hearing loss is not expected to occur.

### 3.3.2.4 Health

Noise is considered to be a possible contributor to stress related health effects such as hypertension, cardiovascular disease, mental illness, birth defects, etc. An outdoor Ldn of 75 is considered to be the threshold above which severe health effects are investigated. Research into these areas is generally inconsistent and contradictory. A good summary of the current status is provided by Von Gierke (1990): "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of

hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dB for complete protection against hearing loss for an eight-hour day). At the recent (1988) International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous.

### 3.3.2.5 Summary of Noise Guidelines

Table 3.3-1, taken from HQ, USAF/LEEVX, 1984, summarizes expected adverse effects of noise at various levels. These effects follow from the above discussion.

### 3.3.2.6 Noise Sources

Modern military aircraft use either turbojet or turbofan engines. The gas leaving the exhaust nozzle in a turbojet is the predominant source of noise produced, although there are several other sources of objectionable noise. The turbofan engine noise originates mostly at the engine inlet, the fan duct outlets, and the engine exhaust nozzle. The exhaust gas velocity at the nozzle is relatively less in a turbofan than in a turbojet having equivalent thrust. As a consequence, the primary exhaust gases through the basic engine section of a turbofan are not the principal sources of objectionable noise as in a turbojet. Other objectionable noise arises from the shear layer formed between the exhaust gases either from the fan or jet nozzle and the surrounding atmosphere. Also, the use of afterburners, which increase the nozzle gas velocity, can substantially increase the noise level.

Aircraft noise is dictated by the aircraft's speed and its power settings. With increasing speeds the sound level at the ground decreases while increasing the power increases the radiated noise from the engine. During a mission, the pilot will vary the speed and power settings that in turn will vary the radiated noise levels. Other parameters that affect the speed and power settings are the vehicle weight, configuration, orientation, and wind speed. For these reasons, identical aircraft, using different aircraft settings, may produce different sound exposure levels.

Typical sound exposure levels for the aircraft considered in this study are listed in Table 3.3-2. The sound levels reported here assume power and speed settings equivalent to the conditions found on MTRs. The distance between the aircraft and observer is assumed to be 500 feet. As Table 3.3-2 shows, converting F-111D to F-111F aircraft results in a 2 dB sound level increase and the loudest aircraft is the B1-B.

**Table 3.3-1. Summary of Adverse Effects of Noise**

Effects <sup>1</sup>	Hearing Loss		Speech Interference		Annoyance <sup>2</sup>	Average Community Reaction	General Community Attitude Towards Area
	Indoor	Outdoor	Indoor	Outdoor			
Day-Night Average Sound Level, in Decibels	% Sentence Intelligibility		Distance in Meters for 95% Sentence Intelligibility		% of Population Highly Annoyed <sup>3</sup>		
75 and above	May Begin to Occur	98%	0.5		37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9		26%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5		15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0		9%	Moderate to	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5		4%	Slight	Noise is considered no more important than various other environmental factors.

1. "Speech Interference" data are drawn from the following tables in EPA Report 550/9-74-004, Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise".

2. Depends on attitudes and other factors.

3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

**Table 3.3-2. Typical Sound Exposure Levels for Aircraft**

AIRCRAFT	SEL
	at 500 feet from observer in Ldnmr dB
F-111D	110
F-111F	112
EF-111	112
A-7	99
A-6	105
F-18	114
B-1B	118
B-52	114

### 3.3.3 Cannon AFB, Baseline Operations

Noise exposures in the vicinity of Cannon AFB are from a combination of local ambient noise from road traffic and occasional railroad traffic (in and near Clovis) and noise from the base aircraft operations, which occur sporadically during each active day at the base.

The principal user of Cannon AFB is the 27th FW, which has 62 F-111D aircraft at the base and performs about 8,200 sorties per year from the Cannon runways. Each sortie comprises one takeoff and landing and may also include closed-pattern (CP) training maneuvers. On an average busy day at Cannon AFB, 50 sorties and approximately 157 CP go-arounds are flown. Of these, on average, about 1.5 sorties and 4.5 CPs are flown between 10:00 p.m. and 7:00 a.m. In addition to these based F-111D aircraft, other (transient) users of Cannon AFB include A-4, A-6, A-7, A-10, C-9, C-130, C-141, DC-9, F-4, F-14, F-16, T-37 and T-38 aircraft. These additional operations total about 43 takeoffs and landings and about 17 CPs on an average busy day, none of which typically occur at nighttime.

These operational data have been described in detail by Cannon AFB personnel for the purpose of developing noise exposure contours. These have been compiled as an input data file to the NOISEMAP computer program by the Air Force Civil Engineering Support Agency (AFCESA) at Tyndall AFB. NOISEMAP is a computer program developed by USAF for environmental noise analysis. The program requires flight operations on each runway to be described in terms of aircraft type, flight track flown, altitude, power setting and aircraft speeds used, and the numbers of such flights during daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.). Other aircraft operations that cause localized noise emissions are those of aircraft and engine maintenance (ground run-up) tests. At Cannon AFB, these are conducted using four run-up test pads, one Grade II noise suppressor test cell, and one hush house-facility for F-111D testing. These operational facilities and their use are also defined in the NOISEMAP database for Cannon AFB. Afterburner power, which generates higher noise levels than normal military (takeoff) power, is used during about 25 percent of the F-111D departures from Cannon AFB. This is also included in the NOISEMAP analysis.

These operational details are used by the NOISEMAP program, which calculates noise levels at points on a regularly spaced grid of up to 100 by 100 points surrounding the runways. The noise levels are calculated in terms of Ldn or other specified metrics and are input to a contouring program, which generates the contours. From this grid analysis, contours of equal noise exposure, expressed as Ldn, are generated by a contouring program and superimposed on land-use maps to assess noise impact and define incompatible land uses within each contour area. The noise contour analysis for military (and civilian) airfields is normally required to generate noise contours at 5-dB increments from Ldn 65 dB to the highest level that encompasses incompatible land use (such as residential structures). Noise contours for existing operational levels of aircraft activity at Cannon AFB are shown in Figure

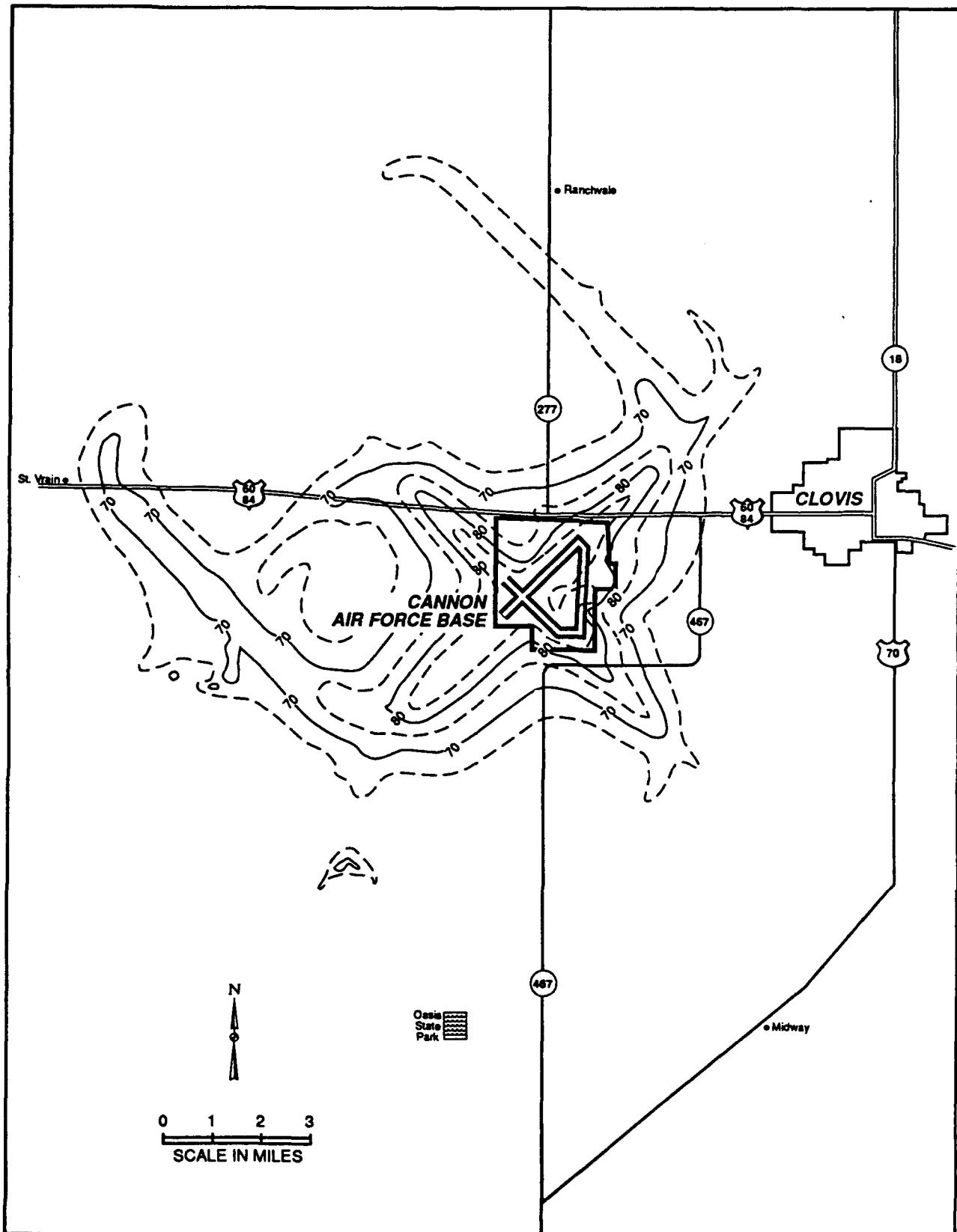
3.3-3, and land uses within each contour level are described in Table 3.3-3. In general, the current noise impact area enclosed by the Ldn 65 dB contour is predominantly used for agricultural purposes with about 7 percent of the total enclosed land area being residential. No schools or civilian hospital facilities are within the Ldn 65 dB contour around Cannon AFB. Field surveys of the contour areas indicate that there are 151 dwellings within the Ldn 65 dB contour with approximately 400 resident occupants. Most of the noise-impacted dwellings are to the north of and along Highway 60. Many of these, especially within the Ldn 70 dB contour, are of mobile or trailer home construction. At the higher Ldn contour levels, the surveys indicate a total of 114 dwellings within the Ldn 70 dB contour and 21 dwellings within the Ldn 75 dB contour. Resident population estimates are, respectively, 302 people and 56 people within these contour levels.

It should be noted that the land areas and populations listed for each Ldn contour are those for the entire area within the contour line and include land and populations within the next higher Ldn contour. Thus, the 400 residents within the Ldn 65 dB contour include those 302 people noted to reside within the Ldn 70 dB contour. Similarly, the 302 people within the Ldn 70 dB contour include the 56 residents within the Ldn 75 dB contour. Using the relationship between Ldn values and percent of people exposed to noise who would be expected to be "highly annoyed," as shown in Figure 3.3-2, the total number of residents estimated to be in this category is 97 of the 400 persons currently exposed to levels above Ldn 65 dB.

These estimates of exposed and "highly annoyed" residents for current aircraft operations at Cannon AFB are used in this EIS as a baseline upon which to evaluate increases in noise impact due to the action. Similar estimates are given later in this document for the land areas under the Mount Dora MOA, the low-altitude MTRs, and the Melrose Range.

### **3.3.4 MTRs, Baseline Operations**

ACC conducts missions under visual flight rules (VFR) and instrument flight rules (IFR). The objective of these missions is to practice low-altitude point-to-point navigation within a designated MTR. ACC low-altitude operations have stage lengths of 200 to 300 nautical miles (nm) during which the minimum altitude above the ground may vary between 100 and 500 feet. These flights tend to be within a few hundred miles of the Base and usually occur between 7:00 a.m. and 10:00 p.m. Operations along MTRs are constrained to one direction along a route with the flight tracks distributed about the route centerline. When ACC flies a route, the flight tracks will be distributed as a normal distribution, with a standard deviation that is determined by the route width. The wider the route the more dispersed the tracks become. Routes in the Cannon AFB area vary in width between 3 and 40 nm. Typically the routes are



**Figure 3.3-3. Ldn Noise Contours for Cannon AFB Based on Yr 1991 Operations**

**Table 3.3-3 Land Use within Ldn Noise Contours  
Cannon AFB under Existing Conditions**

Day-Night Sound Level Contour Lower Bound (dB)	80	75	70	65
<b>No. of Dwellings Outside of Base</b>	7	21	114	151
<b>No. of Residents* Outside of Base</b>	19	56	302	400

\* Based on the number of dwellings multiplied by persons per household for Curry County

about 10 nm wide. The standard deviation used in these calculations is either 1.25 or 2.5 nm. The former is used for the narrower routes (less than 6 nm), and the latter is used for the wider routes.

The sound levels produced on the MTRs when there were 77 F-111s stationed at Cannon AFB are shown in Table 3.3-4. The table shows the sound levels at the center of the route where the levels are highest. The sound levels are tabulated according to route segments. The sound level will vary between route segments depending upon the floor and width of the route. Route segments having the same width and floor will have identical noise levels. The average altitude is 750 feet AGL.

The noise levels reported here are lower than the previous estimates (TAC, 1990). The current calculations accurately account for aircraft lateral and vertical dispersions on the routes. Using these revised estimates, the noise levels shown here more accurately portray the actual noise levels below these routes.

VR-100 and VR-125 are identical routes flown in opposite directions. The sound levels for these routes must be summed together, resulting in an  $L_{dnmr}$  3 dB increase. VR-100 A-B plus VR-125 P-Q has a combined sound level of  $L_{dnmr}$  54 dB. The highest level reported is  $L_{dnmr}$  60 dB for IR-109 E-AO. The route width for this segment is 4 nm; approximately 110 sorties per month are flown on this segment.

### **3.3.5 MOAs and Ranges, Baseline Operations**

Table 3.3-5 shows the altitude distribution assumed for the Pecos Low and Pecos High MOAs. These distributions were used to estimate the two baseline conditions shown in Table 3.3-6. The analysis assumes that the aircraft are distributed randomly in the horizontal plane, and Pecos Low and Pecos High MOAs are scheduled separately.

In the 1990 EIS, noise levels for the Mount Dora MOA were projected assuming that there would be 792 sorties from the 27th FW/474th Training Wing (TW) and 1,036 sorties from other users. In Table 3.3-6, the 1991 baseline column shows the noise level in Mount Dora due to the other users and the 1992 baseline column shows the noise level in Mount Dora resulting from the combined operations of the other users and the 27th FW/474th TW. This analysis assumes that the SEL for the other users is the same as for the F-111s, and the altitude distributions are alike.

Noise levels for the Red Rio and Oscura Ranges were obtained using a similar scaling technique. Recently, a detailed analysis was made of a composite wing using the Saylor Creek Range, located near Mountain Home AFB, ID. Results from this analysis were used to estimate the noise levels at Red Rio and Oscura

**Table 3.3-4. Baseline MTR Noise Levels**

<b>Military Training Route Segments</b>	<b>Baseline 1991 and 1992 Noise Levels (L<sub>dnmr</sub>)</b>
IR-107 Entire Route	59
IR-109 A-E	57
E-AO	60
AO-End of Route	57
IR-110 EA-XJ	48
IR-111 A-S	57
IR-112 A-N	48
IR-113 A-R	58
VR-100 A-B	51
B-F	54
F-Q	51
VR-108 A-P	52
VR-114 A-G	58
VR-125 A-L	51
L-P	54
P-Q	51

**Table 3.3-5. Pecos MOA Altitude Distribution**

**a. Pecos Low MOA**

Altitude (Ft AGL)	Aircraft Type			
	EF-111	F-111	F-15	F-16
100-300	0	0	0	0
300-500	0	0	0	0
500-1,000	30%	45%	45%	45%
1,000-10,000	35%	25%	25%	25%
10,000 +	35%	30%	30%	30%

**b. Pecos High MOA**

Altitude (Ft AGL)	Aircraft Type			
	EF-111	F-111	F-15	F-16
100-300	0	0	0	0
300-500	0	0	0	0
500-1,000	0	0	0	0
1,000-10,000	0	0	0	0
10,000 +	100%	100%	100%	100%

**Table 3.3-6. Baseline MOA and Range Noise Levels**

		1991 Baseline ( $L_{dnm}$ )	1992 Baseline ( $L_{dnm}$ )
MOAs	Pecos Low	53	53
	Pecos High	36	36
	Mt. Dora	46	49
Ranges	Red Rio	61	70
	Oscura	65	71

by scaling the Range areas and the number of operations. The noise levels were calculated as follows:

$$Ldnmr = 66 + 10 \log 10 (N/Nscr) + 10 \log (Ascr/A)$$

Where Ascr = Area at Saylor Creek Range

Nscr = Number of operations at Saylor Creek Range

This analysis approach assumes that the type of aircraft, their mix, and the respective altitude distribution are similar between bombing ranges. The calculated noise levels are shown in Table 3.3-6.

### 3.3.6 Melrose Range, Baseline Operations

The noise environment in the vicinity of Melrose Range has been addressed in the 1990 Cannon EIS (TAC,1990). The current analysis uses the same methodologies and assumptions described in the 1990 EIS. The 1990 study was coordinated by staff of the 27th FW at Cannon AFB and included compilation of range usage by different aircraft over a 12-month period. The flight profiles used by these aircraft were also defined for purposes of modeling the noise exposures resulting from these flight operations.

The 1990 EIS and the current analysis used NOISEMAP to evaluate the noise exposure on the range. Both analyses used the same flight tracks, altitude profiles, aircraft power settings and speeds, and the number of passes flown during each sortie at the range. The only parameter that was adjusted was the number of aircraft flown per day.

Table 3.3-7 summarizes the operational data used to estimate noise exposure for the 1991 and 1992 baseline conditions. The total number of sorties per year was obtained by comparing the actual number of aircraft stationed at Cannon AFB with the range usage records reported in the 1990 EIS. These records covered a period from October 1988 through September 1989. The total sorties are divided by 260 days per year of range usage to obtain the average busy day number. The range has a large fluctuation in monthly usage, the most busy month having 60 percent more operations than the annual average month. The noise analysis included this factor to represent this most active monthly use of Melrose Range. In addition, an average of three passes of the range flight tracks per sortie were factored into the daily operations. The number of passes per day over the target area on Melrose Range is shown in Table 3.3-7. The total number of daily passes for the most active month was found to be 124 passes for the 1991 baseline and 140 daytime passes and 10.6 nighttime passes for the 1992 baseline.

These range operations are typically conducted on seven specific flight target tracks comprising closed-loop patterns as illustrated in Figure 3.3-4, although other target approaches do occur from other (more random) directions. The

**Table 3.3-7. Track Usage at Melrose Range by Specific Aircraft  
Aircraft Passes Per Day\***

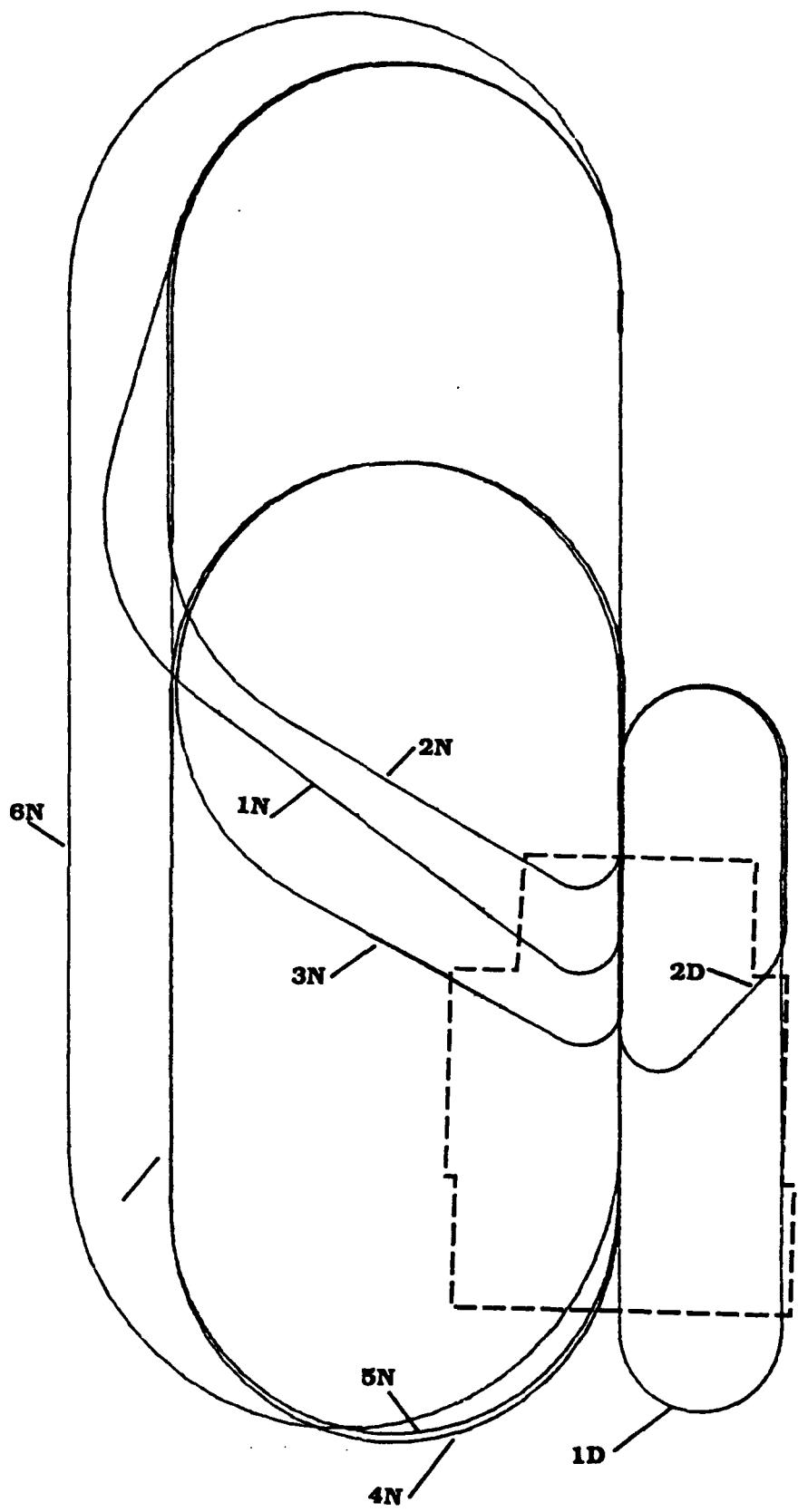
**1991 Baseline**

Aircraft	1D	2D	1N	2N	3N	4N	5N	6N	Total
F-111						48.3	48.3		96.6
EF-111									
F-117									
A-7	15.4	5.1	1.7	0.9	0.4	0.9	0.4		24.8
A-6									
F-18	0.5	0.1							0.6
B-1B									0.3
B-52G						0.6	0.6		1.2
Other	0.4	0.1							0.5
TOTAL PASSES PER DAY									124

**1992 Baseline**

Aircraft	1D	2D	1N	2N	3N	4N	5N	6N	Total
F-111						48.3	48.3		96.6
EF-111									
F-117	9.8	3.3	1.1/4.2	0.6/2.1	0.3/1.1	0.6/2.1	0.3/1.1		16.0/10.6
A-7	15.4	5.1	1.7	0.9	0.4	0.9	0.4		24.8
A-6									
F-18	0.5	0.1							0.6
B-1B									0.3
B-52G						0.6	0.6		1.2
Other	0.4	0.1							0.5
TOTAL PASSES PER DAY									140/10.6

\* Single values represent daytime only; dual values are day/night.



**Figure 3.3-4 Melrose Range Flight Tracks**

seven tracks include two daylight tracks (1D and 2D) and five day-night tracks (1N, 2N, 3N, 4N, and 5N). The latter are used during darkness hours but before 10:00 p.m. Tracks 4N and 5N are assumed to have limited activity after 10:00 p.m. An additional track, 6N, is used to represent the wider track pattern of the B-1B aircraft using the Melrose Range.

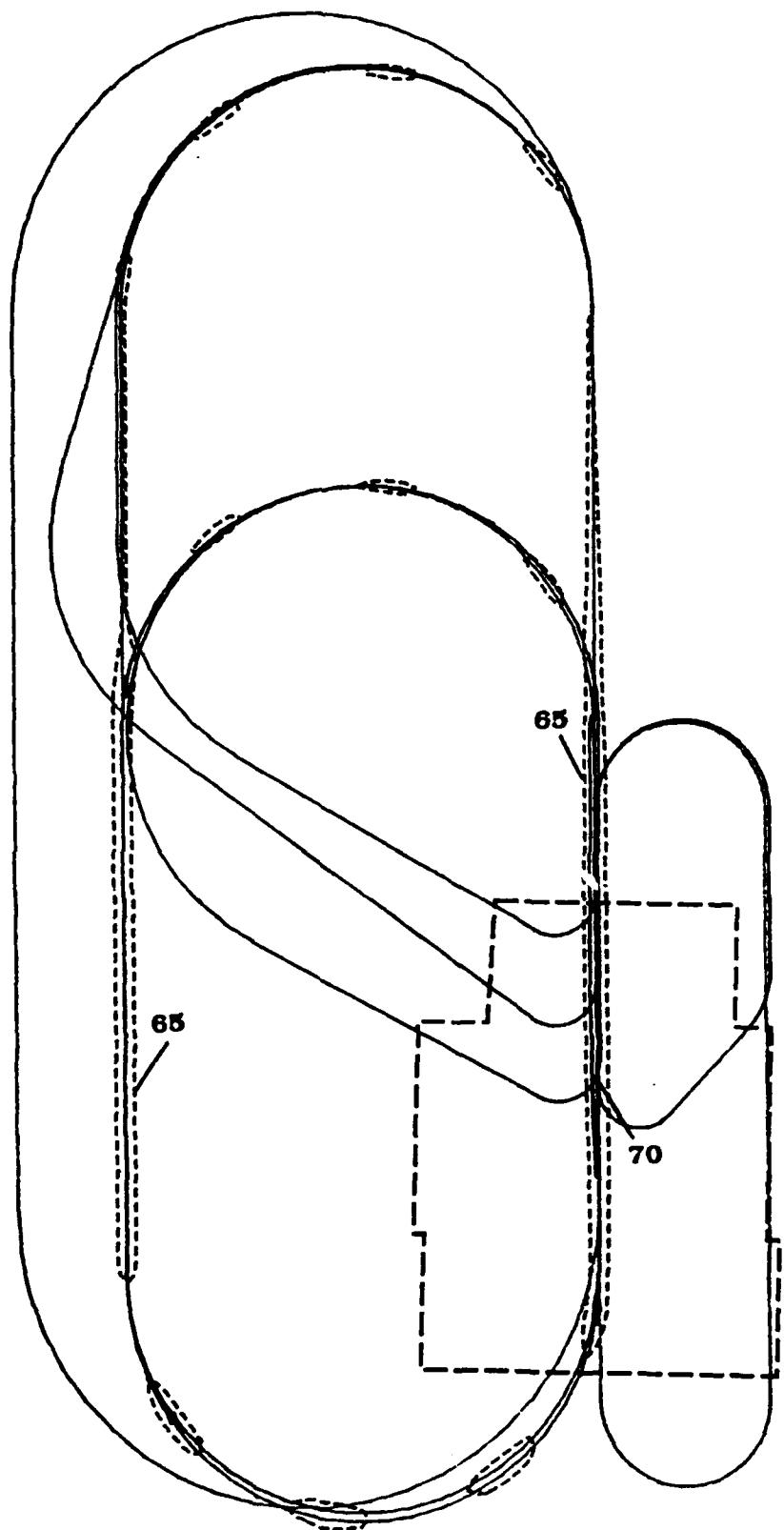
Altitude and speed profiles are combined with the aircraft usage to estimate the noise levels on the ground. In general, aircraft approaching Melrose Range for a first pass climb to about 1,000 feet AGL at 20 miles from the target area to receive clearance from the Range Control Office (RCO) to enter the Range airspace. Occasionally, pilots will then descend to about 200 feet AGL for altimeter calibration and then return to the usual 1,000 feet AGL pattern. On turning into the approach leg of the pattern, the aircraft start a descent and acceleration to 400 feet AGL and depart the target area in different climb profiles. Some aircraft (notably B-52 and F-111) climb steadily, returning to 1,000 feet AGL. Other aircraft perform a more rapid ascent during ordnance release and climb to altitudes as high as 2,500 feet AGL before returning to as low as 1,000 feet AGL on the downward leg of the pattern. These flight profiles and tracks for Melrose Range usage have been used to develop Ldn noise contours for the range, which are shown in Figures 3.3-5 and 3.3-6. The noise contours shown in these figures are for Ldn values of 65, 70, and 75 dB. The noise contours generally depict the much greater use of the large radii tracks by F-111 and B-52 aircraft. Usage of the smaller radii tracks is primarily by other aircraft and does not create noise exposures greater than Ldn 65 dB for the current number of operations. Table 3.3-8 summarizes the acreage exposed to noise levels of Ldn 65 dB and above. Increases in noise contour area are shown in this table for the two baseline conditions.

### **3.4 AIRSPACE MANAGEMENT**

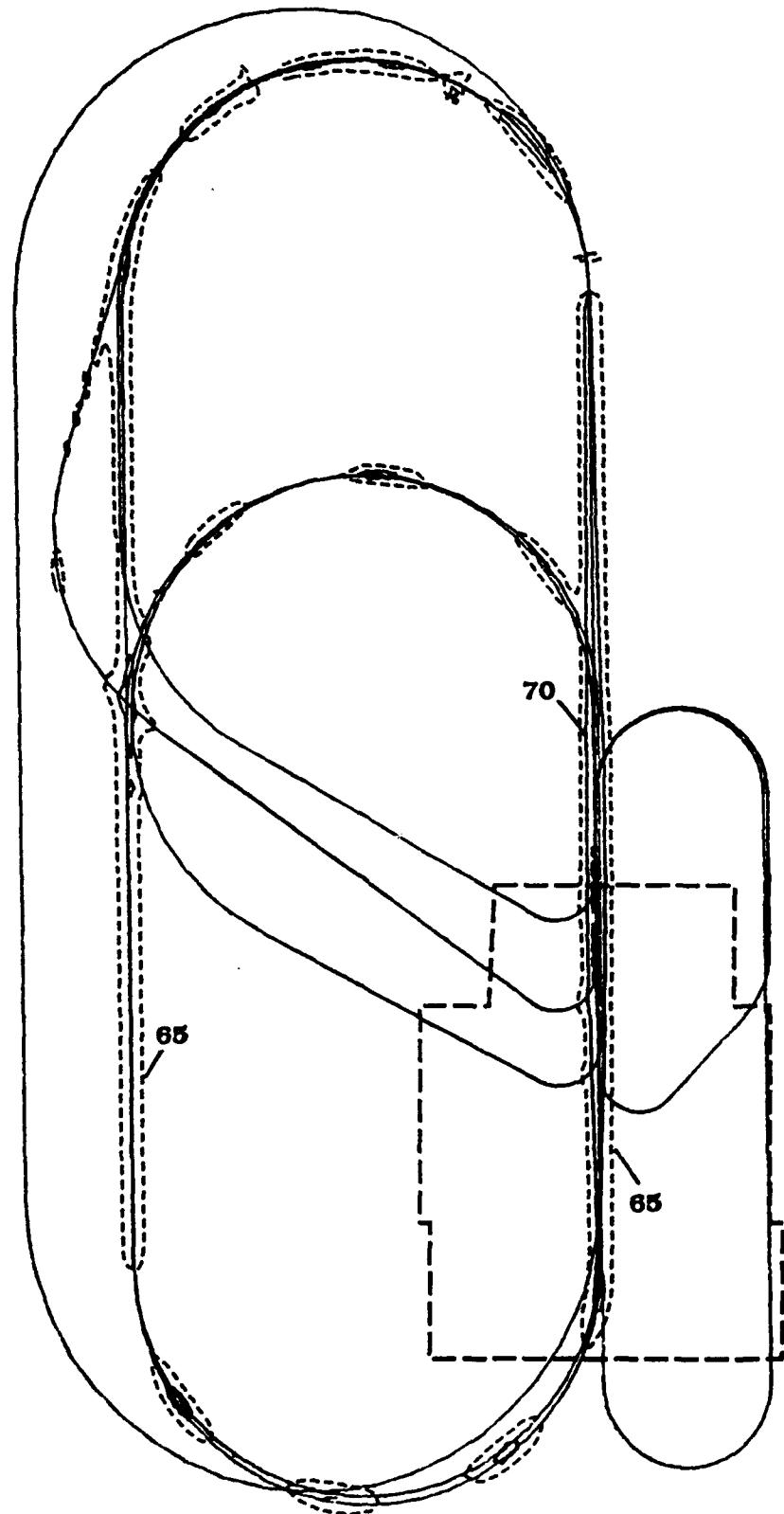
The existing airspace environment consists of three basic elements: (1) Controlled Airspace for the control of military and civil air traffic in the Cannon AFB area, (2) Special Use Airspace (SUA) (restricted areas and MOAs), and (3) MTRs. The following discussion describes each of these elements in relation to military and civil use of this airspace.

#### **3.4.1 Cannon AFB and Environs**

Controlled Airspace at Cannon AFB includes a control zone, transition area, airport traffic area, and approach control area (Figure 3.4-1), all of which are basic to all military and civil airports where radar and control tower air traffic control services are provided. These areas serve in concert with each other to help ensure the safe passage of aircraft operating to or from an airport or transiting through airspace surrounding the airport environment. Such aircraft are subject to the air traffic control rules and Federal Aviation Administration (FAA) Regulations governing the use of these areas. The control zone and airport traffic area each encompass a 5-statute-mile radius of the airfield from the surface up to 14,500 feet Mean Sea Level (MSL) and 3,000 feet AGL, respectively. This area provides control of air traffic in the immediate vicinity of



**Figure 3.3-5. Existing 1991 Baseline Noise Contours,  
Melrose Range, without F-117 Aircraft**



**Figure 3.3-6. Projected 1991 Baseline Noise Contours,  
Melrose Range, with F-117 Aircraft**

**Table 3.3-8. Noise Impact Due to Baseline Operations  
at Melrose Range**

**1991 Baseline**

<b>L<sub>dn</sub> Value</b>	<b>Acres</b>	<b>Square Miles</b>
65.0	26,878.6	42.0
70.0	5,260.9	8.2
75.0	0.0	0.0
80.0	0.0	0.0

**1992 Baseline**

<b>L<sub>dn</sub> Value</b>	<b>Acres</b>	<b>Square Miles</b>
65.0	44,478.9	69.5
70.0	15,314.1	23.9
75.0	3,300.0	5.2
80.0	0.0	0.0

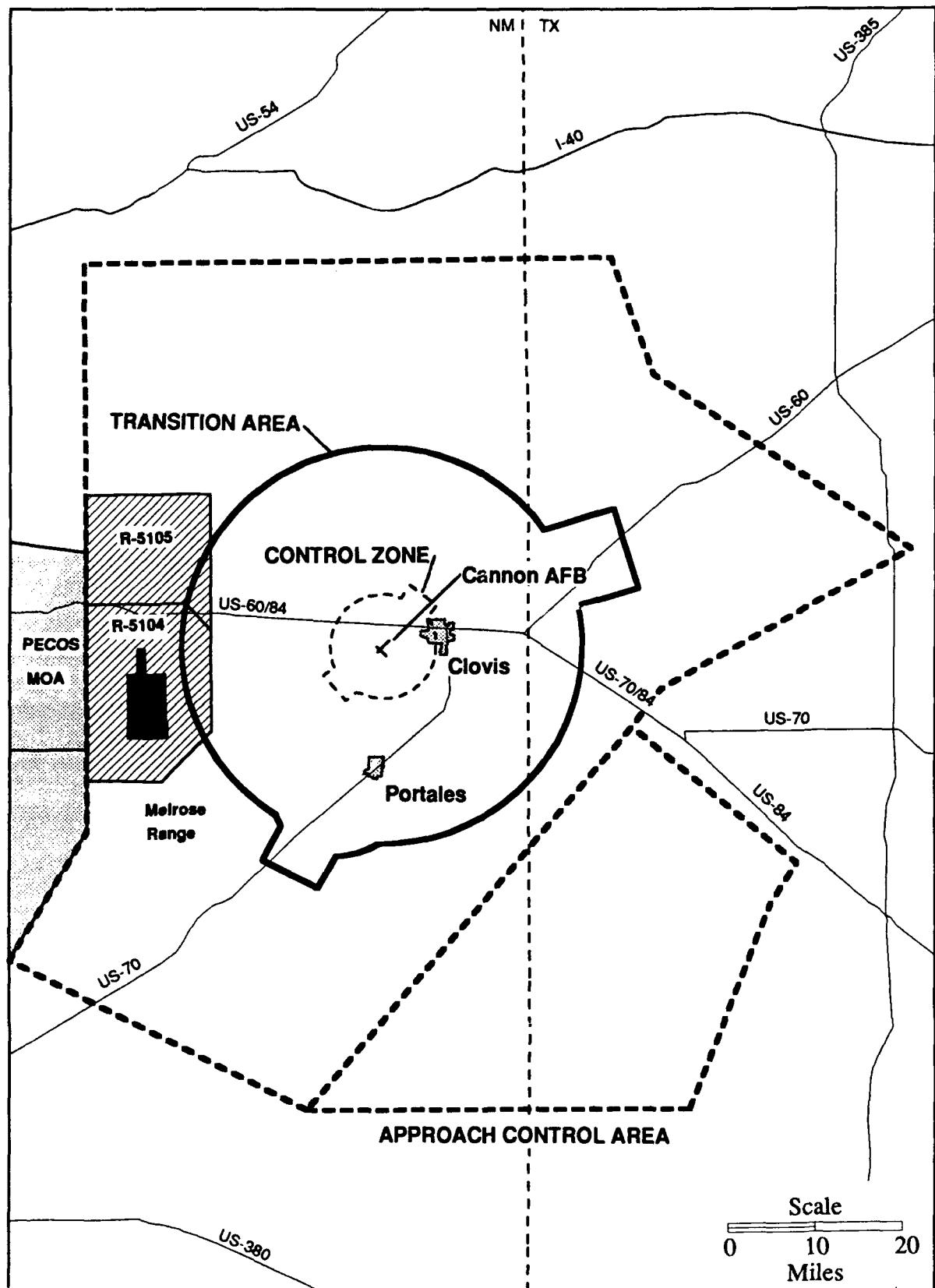


Figure 3.4-1. Controlled Airspace, Cannon Air Force Base

the base. The transition area encompasses an area within a 23-statute-mile radius of the base (plus extension for instrument approach procedures) to contain IFR operations at Cannon AFB, Clovis, and Portales between 700 feet AGL and 14,500 feet MSL. The Cannon AFB approach control area is a larger, irregular expanse of airspace from the surface to 17,000 feet MSL (10,000 feet MSL in the southeast section) within which IFR aircraft (and VFR aircraft upon request) are provided radar air traffic control services. This control applies to all aircraft, whether they are operating to or from one of the three airports, or simply transiting through the area. There is very little interaction with other IFR traffic in the airspace above and adjacent to the Cannon AFB approach control area. Cannon AFB aircraft conduct occasional operations at the Roswell, Lubbock, and Amarillo airports.

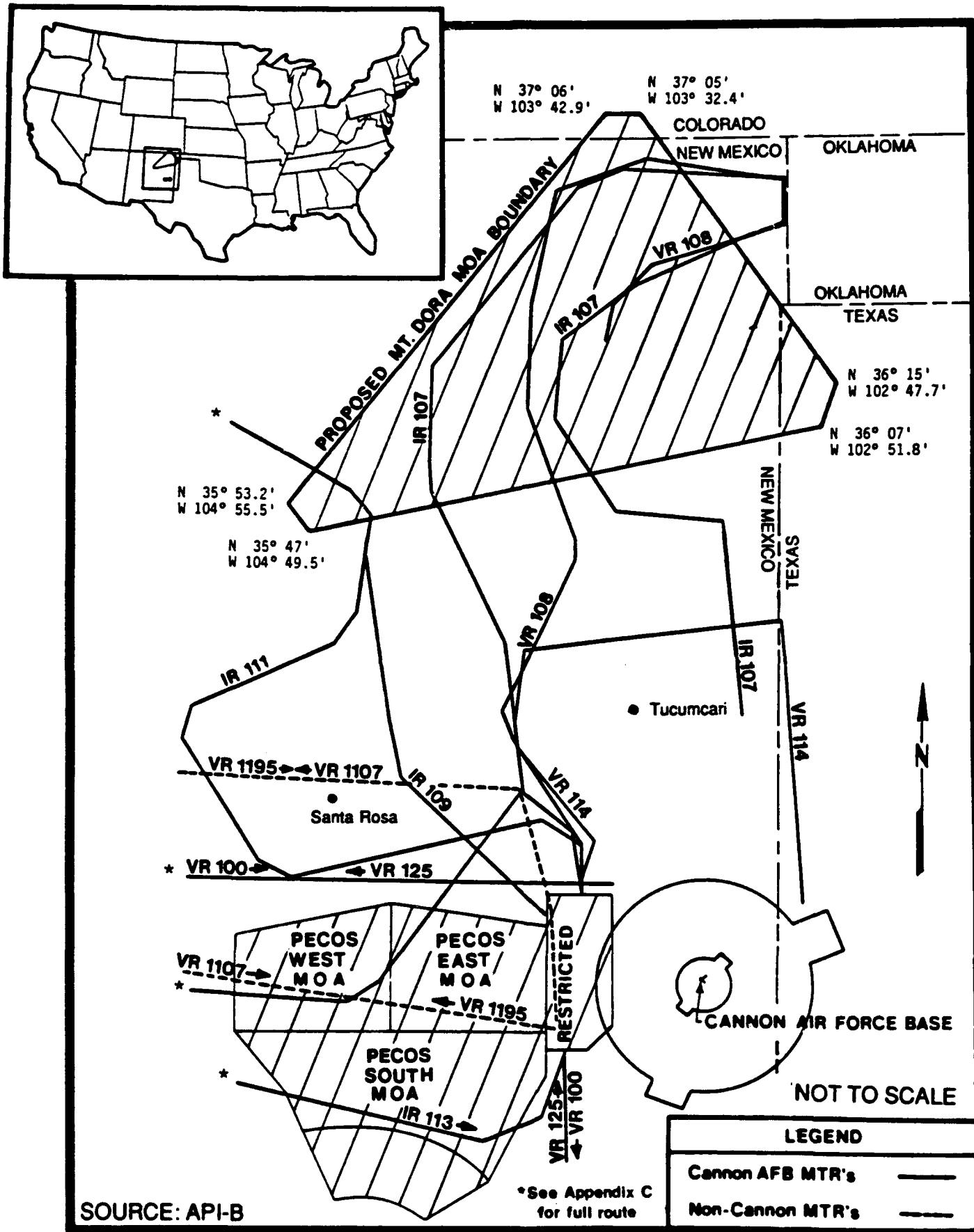
Approximately 60,000 combined military and civil radar air traffic operations were conducted within the controlled area in FY91. The control tower handled approximately 65,000 operations within the airport traffic area during this same period. These figures include multiple practice takeoffs and landings at Cannon AFB by individual sorties.

### **3.4.2 Affected MTRs**

MTRs are airspace corridors approved by the FAA for conducting low-altitude training flights at speeds in excess of 250 knots below 10,000 feet MSL. Two types of MTRs associated with this action are (1) Instrument Routes (IRs) flown under IFR, which can be flown in instrument or visual weather conditions, and (2) Visual Routes (VRs) flown under VFR, which can only be flown under visual conditions. MTRs are nonrestrictive in that nonparticipating aircraft can fly within them while exercising caution. MTR hours of operation can vary from specific time periods to continuous, as published on aeronautical charts.

There are several different MTRs that enter or exit the Pecos MOA, the Mount Dora MOA, and Restricted Areas, as depicted in Figure 3.4-2. Eight of these MTRs are scheduled by Cannon AFB and are used for low-altitude flight training requirements in conjunction with other training in the MOA or Melrose Range. IR-110 and IR-112, scheduled by Cannon AFB, do not enter or exit the Pecos MOA, Mount Dora MOA, or the Melrose Range airspace. They do, however, provide low level training and access, in conjunction with other MTRs, to other range areas and bomb scoring sites outside of the local area. The Cannon MTRs have a combined annual use of approximately 9,550 sorties. VRs 1107/1195 transit the Pecos MOA but are not a part of the proposed action and therefore are not discussed.

The following summary of Cannon AFB MTRs describes the published width and floor as well as specified restrictions for each route. Details of each MTR, such as originating and scheduling activities, hours of operation, route description, terrain-following operations, and special operating procedures, are found in Appendix A.



IR-107 has a width of 7.5 nm either side of centerline and a 100-feet AGL floor. Flight restrictions along this route include 1,000 feet AGL and 1 nm for ranches; and 2 nm for Capulin Volcano National Monument, a ranch near Quay, and the village of House, New Mexico, near the Melrose Range. The Bell Ranch Complex is avoided by 1,000 feet AGL and 1.5 nm, and the Tesquite Creek area is specified for lateral avoidance.

IR-109 has varying widths from 1 to 5 nm either side of centerline with a floor of 100-feet AGL. Flight restrictions along this route include 3 nm for the town of Guadalupita and 2 nm for the towns of Ocate, House, and Naranjos, New Mexico. A 1,000-feet AGL or 1 nm avoidance area is also specified along the Yeos Creek beneath the Pecos MOA.

IR-110 varies in width from 4 to 8 nm either side of centerline with a floor of 100 feet AGL. Flight restrictions include a 400 feet AGL minimum altitude in the Fort Carson Pinyon Canyon helicopter maneuvering area.

IR-111 has varying widths from 4 to 6 nm either side of centerline and a floor of 100 feet AGL. Restrictions along this route include 2 nm for the towns indicated above for IR-109, and 1,000 feet AGL and/or 1 to 3 nm, as specified, for 7 different ranches, a truck stop, the towns of South San Ysidro and Pastura, and Interstate 25.

IR-112 varies in width from 4 to 5 nm either side of centerline. The floor of the route is the surface. Flight restrictions require avoidance of charted airfields by 1,000 feet vertical or 1 nm lateral separation. Two additional specified avoidance areas governed by the same criteria include a location south of Winslow and the Navajo village of Twin Lakes north of Gallup.

IR-113 varies from 4 to 5 nm in width either side of centerline and has a floor of 100 feet AGL. All charted airfields are avoided by 1,500 feet AGL and 3 nm with a restriction of 1,000 feet and/or 1 to 2 nm, as specified, around 6 different ranches, the towns of Duran, Willard, Vaughn, and Claunch, and the Sumner Lake Recreational Area. This route description includes the caution of a heavy concentration of waterfowl in the area of the Bitter Lake NWR.

VR-100 and VR-125 reverse each other and vary in width from 1.5 to 28 nm either side of centerline and can be flown as low as practical to the surface. Charted airfields are avoided as previously stated. These routes avoid the Gran Quivira Unit of Salinas Pueblo Missions National Monument by 3 nm and 9 different ranches by 1,000 feet AGL and/or 1-3 nm, as specified for each. A 1,000-feet AGL altitude restriction exists over the Lincoln National Forest.

VR-108 has varying widths from 5 to 20 nm either side of centerline with a floor of 100 feet AGL. Besides the standard restriction around charted airfields, there is a 1 nm avoidance area around Mosquero and a 2 nm area around Capulin Volcano National Monument, Bell Ranch, Quay, Kenton State Park, two specified ranches, and House, New Mexico. An area around Tesquite Creek is also designated for avoidance.

VR-114 varies in width from 10 to 20 nm either side of centerline with a floor of 100 feet AGL. Mosquero is avoided by 1 nm. The villages of Quay and House, north of Melrose Range are avoided by 2 nm.

### **3.4.3 Melrose Range and R-5104/R-5105**

The Melrose Range is located within Restricted Area R-5104A. R-5104A is a subpart of R-5104, which also contains R-5104B. These restricted areas are located 20 statute miles west of Cannon AFB. R-5104A extends from the surface to Flight Level (FL) 180, and R-5104B extends from FL 180 to FL 230. R-5105 extends from the surface to 10,000 feet MSL. These areas are used in conjunction with each other to provide restricted airspace for flight maneuvers to Melrose Range. This range, which occupies 77,190 acres, is used primarily for air-to-ground weapons delivery using inert, nonexplosive ordnance. Over 7,100 annual sorties were conducted within the Melrose Range/Restricted Areas by Cannon AFB and other users in 1991. This complex is normally available for scheduling from 9:00 a.m. to 10:00 p.m. Monday through Thursday and 9:00 a.m. to 6:00 p.m. on Fridays. The Range is, on the average, scheduled for 250 hours per month.

### **3.4.4 Red Rio Range and R-5107B/J**

The Red Rio Range, an air-to-ground tactical gunnery range, is located 54 nm north of Holloman AFB, NM, within the WSMR Complex. It is contained within R-5107B, which extends from the surface to unlimited altitudes. R-5107J, which extends from the surface to 9,000 feet MSL, is also used in conjunction with the Range to provide additional protected airspace for the target run-in-flight patterns. This Range is normally used sunrise to sunset, Monday through Friday, and at night and on weekends only as needed. As indicated in Table 2-3, approximately 1,940 sorties were conducted within the Red Rio Range in 1991.

Use of the restricted airspace overlying the Red Rio Range by nonparticipating civil or military aircraft during weekday active periods is not permitted unless specifically authorized by the WSMR mission control at Holloman AFB. That portion of the Range airspace north of State Highway 380 and below 9,000 feet (R-5107J) is open for use by civil aircraft on weekends. If that Range portion will be active on the weekend, a Notice to Airmen (NOTAM) is disseminated which advises pilots of potential hazards and restricts their use of this airspace during that period. Due to the high volume of civil air traffic in the VFR corridor adjacent to the east boundary of the Range and the close proximity of the Carrizozo airfield, military operations within the Red Rio airspace exercise extreme caution when operating in this vicinity of the Range boundary.

### **3.4.5 Oscura Range and R-5107B**

The Oscura Range, an air-to-ground scorable gunnery range located 40 nm north of Holloman AFB, is also a part of the WSMR Complex and is contained within R-5107B. The Range is normally operated 7:00 a.m. to 4:30 p.m., Monday through Friday, and sunset to 12:00 p.m., Monday through Thursday. Approximately 4,232 sorties were conducted within this Range in 1991.

Nonparticipating aircraft are not permitted use of the Oscura Range airspace unless specifically authorized by the WSMR mission control. Due to the high volume of civil aircraft utilizing the VFR corridor (Highway 54) adjacent to the east boundary of the Range, military flight east of this highway is avoided except during Range entry and exit.

### **3.4.6 Mount Dora MOA**

The Mount Dora MOA is to be subdivided laterally into north, east, and west areas and stratified vertically from 1,500 feet AGL up to, but not including, 11,000 feet MSL (Mount Dora Low), and 11,000 feet MSL up to, but not including, 18,000 feet MSL (Mount Dora High). These altitude divisions will permit efficient scheduling and productive joint use of the airspace.

There are four Jet Routes (above FL 180) above Mount Dora MOA and three Federal Airways (below 18,000 feet MSL) circumnavigating this airspace. The MOA does not conflict with air traffic on these routes and airways. Three public-use airports are located within the lateral boundaries of the MOA. These are Clayton Municipal Airport (Clayton, New Mexico), Price Ranch Airport (Mount Dora, New Mexico), and Roy Municipal Airport (Roy, New Mexico). The 1,500 feet AGL floor of the MOA is above the typical VFR traffic pattern altitudes (800 to 1,000 feet AGL) that would be flown at these airports. There are also seven private airports within the geographical area of the MOA. The New Mexico private airports are in the vicinity of Valmora, Roy, Des Moines, Levy, and Bueyeros. Two of the private airports are near Perico, Texas. The traffic pattern altitudes of these airports would also be below the floor of the Mount Dora MOA with the base of 1,500 feet AGL. The Mount Dora MOA will not require any adjustments to this base altitude to accommodate the Clayton Municipal Airport or other charted airports in the area. Three major federal highways pass beneath the MOA which are used as visual "flyways" by general aviation aircraft transiting this area under VFR. VFR aircraft along any of those surface routes would not be restricted with the MOA base at 1,500 feet AGL. Some crop dusting also occurs in this area; however, these operations could normally be conducted below 1,500 feet AGL. Albuquerque Center (FAA) has remote radio coverage in the area with radar coverage at 11,000 feet MSL and above for air traffic service.

### **3.4.7 Pecos MOA**

The Pecos MOA is located 35 statute miles west of Cannon AFB and is subdivided laterally and vertically for concurrent flight operations as shown in Table 3.4-1. There are no ordnance deliveries in the MOA, and it is used

**Table 3.4-1. Pecos MOA Operating Altitude**

MOA Name	Floor Altitude	Ceiling Altitude
Pecos East High	11,000 ft MSL	17,999 ft MSL
East Low	500 ft AGL*	10,999 ft MSL
Pecos West High	11,000 ft MSL	17,999 ft MSL
West Low	500 ft AGL	10,999 ft MSL
Pecos South High	11,000 ft MSL	17,999 ft MSL
South Low	500 ft AGL	10,999 ft MSL

\* A portion of the Pecos East Low MOA excludes altitudes 1500 feet AGL and below.

MSL - Mean Sea Level

AGL - Above Ground Level

primarily for air-to-air tactics. Current use of the Pecos MOA by Cannon AFB aircraft is approximately 1,326 annual sorties. Other scheduled users flew 7,278 sorties in the MOA.

The Pecos MOA overlies Fort Sumner Municipal Airport; however, a 1,500-feet AGL floor over this area accommodates civil operations at this airport. Aircraft at two small private airfields beneath the Pecos MOA operate below the 500-foot AGL floor or can fly unrestricted through the MOA.

### **3.5 SOCIOECONOMICS**

The current socioeconomic conditions in the region surrounding Cannon AFB are summarized in this section. Socioeconomic factors considered include population, employment, earnings, local housing, various community services, transportation, and public finance.

The economic region potentially affected by realignment activities at Cannon AFB includes Roosevelt and Curry counties. Together these counties make an area within a 30-mile radius of the base. Two cities, Clovis and Portales, would experience much of any economic impact due to the realignment; over 95 percent of military personnel currently living off-base reside in Clovis, and the remaining 5 percent reside in Portales (SAIC, 1989). It is assumed that civilians employed at Cannon AFB have similar residential preferences.

#### **3.5.1 Cannon Air Force Base**

##### **3.5.1.1 Population**

The population in the two-county region was 58,909 persons in 1990 (Bureau of the Census, 1991). The regional population has been stable since 1980, with an annual increase of roughly 0.2 percent. Assuming the same slight rate of increase, the regional population would be 59,500 persons in 1992, when the proposed realignment would take place.

The population of Clovis was 30,954 persons in 1990, slightly less than the population in 1980. The projected population in 1992 is 30,900 persons, little changed from the current level. The population of Portales was 10,690 persons in 1990 and is projected to rise to 10,800 by 1992. In 1990, Cannon AFB had a resident population of 3,819, including military personnel and their dependents (ERIS, 1990). The base-related population living in local communities was approximately 10,390 (assuming an average civilian household size of 2.7 persons), or over 17 percent of the total in the two county region.

The population in the region related to Cannon AFB will increase slightly in 1991 as additional personnel are assigned to the base. Employment at the base will increase by 155 positions (102 military and 53 civilian) because of the transfer of F-111 aircraft (TAC, 1990). Population in the region will increase by an estimated 373 persons. Since on-base family housing is typically fully occupied, it is assumed that all of these additional households will reside in local communities.

**Table 3.5-1. Projected 1992 Population in Roosevelt and Curry Counties, Adjusted for the 1991 Realignment**

<i>Area</i>	<i>1980</i>	<i>1990</i>	<i>1992<sup>a</sup></i>	<i>1992<sup>b</sup></i>
<b>Two-COUNTY REGION</b>				
Curry County	42,019	42,207	42,600	42,954
Roosevelt County	<u>15,695</u>	<u>16,702</u>	<u>16,900</u>	<u>16,919</u>
<b>TOTAL</b>	<b>57,714</b>	<b>58,909</b>	<b>59,500</b>	<b>59,873</b>
<b>SELECTED CITIES</b>				
Clovis	31,194	30,954	30,900	31,254
Portales	9,940	10,690	10,800	10,819

Note:      a. Projected using 1980-1990 annual rate of change.  
                   b. Projected change plus additional population due to 1991 realignment (TAC 1990).

Sources:    *Current Population Reports*, U.S. Bureau of the Census. 1988; *1990 Census of Population and Housing, Summary Population and Housing Characteristics, New Mexico*. U.S. Bureau of the Census 1991.

Table 3.5-1 indicates the projected 1992 population in the region, adjusted for the 1991 realignment.

### 3.5.1.2 Employment and Earnings

The economy of the two-county region is supported by a combination of government and farming employment. In 1989, government employment totaled 8,127 positions, or almost 30 percent of the total 27,337 workers employed. Farming and agriculture employed 2,330 workers, or roughly 8.5 percent of the region total (Bureau of Economic Analysis, 1991). Other growth-supporting sectors include services, which accounts for employment at ENMU, and transportation and utilities, which accounts for Santa Fe Railroad employment. Employment for the two-county region is summarized in Table 3.5-2.

Over time, employment in the region has experienced little growth. The total number of jobs in 1984 was 27,077, less than 1 percent more than the total 5 years earlier. Unemployment rates are lower for the two-county region than for the state. Unemployment in Roosevelt County varied from 3.5 to 4.4 percent in the first half of 1990; Curry County unemployment varied from 5.5 to 7.0 percent. Unemployment for New Mexico varied from 5.8 to 7.4 percent during the same period (Bureau of Labor Statistics, 1990).

Earnings in the two-county region totalled \$486 million in 1989. The distribution of earnings across industries is the same as the distribution of employment; government and agricultural earnings are the largest among growth-inducing industries. Earnings in the two county region are shown in Table 3.5-3.

Employment and earnings related to Cannon AFB are summarized in Table 3.5-4. In FY1990, base-related employment totalled 4,907 positions, including military personnel and appropriated and non-appropriated fund civilians. The total base-related payroll was \$100 million (\$1990). Employment and earnings at the base will be increased slightly in 1991, as noted in the previous section. By FY 91/4, total base-related employment will be an estimated 5,075 positions with total estimated earnings of \$103 million.

### 3.5.1.3 Housing

There are 23,808 housing units in the two-county region according to the 1990 Census (Table 3.5-5). An estimated 13,645 of these units are owner-occupied, while 8,867 are rentals. Over half of the housing in the region is located in Clovis and Portales. There are over 7,800 owner-occupied units and 4,700 rentals in Clovis; there are 2,200 owner-occupied homes and 1,800 rentals in Portales. In 1990, rental vacancy rates in these cities were 11.4 and 12.6 percent, respectively; there were an estimated 773 vacant rentals. All vacant rental units may not, because of their size, price, or quality, be suitable for Air Force families (SAIC, 1989). An estimated 72% of these vacancies (557 units) were suitable for Air Force use. In November 1991, Cannon AFB surveyed the area for available housing and found 148 rental units on the market. Of these, 68% were

**TABLE 3.5-2 EMPLOYMENT BY INDUSTRY IN CURRY AND  
ROOSEVELT COUNTIES, 1989**

<i>Industry</i>	<i>Curry County</i>	<i>Roosevelt County</i>
Farming	902	1,115
Agricultural Services, Forestry and Fisheries	213	100
Manufacturing	862	335
Mining	22	22
Construction	822	292
Transportation and Public Utilities	1,320	344
Wholesale Trade	532	289
Retail Trade	3,864	980
Finance, Insurance and Real Estate	1,194	328
Services	4,167	1,452
Federal Civilian	921	68
Federal Military	3,836	68
State and Local Government	<u>1,808</u>	<u>1,481</u>
Subtotal	20,463	6,874
<b>TWO-COUNTY TOTAL</b>		<b><u>27,337</u></b>

Note: Full- and part-time employment by place of work, including proprietors and wage and salary workers.

Source: Bureau of Economic Analysis, Regional Economic Information System, April 1991.

\*\* Employment is reported by place of work and does not necessarily coincide with the number of workers residing in a specific county. Reported number of Federal workers may be a BEA approximation rather than actual statistic.

**TABLE 3.5-3 EARNINGS BY INDUSTRY IN CURRY AND  
ROOSEVELT COUNTIES, 1989 (\$000)**

<i>Industry</i>	<i>Curry County</i>	<i>Roosevelt County</i>
Farming	\$ 29,736	\$ 26,300
Agricultural Services, Forestry and Fisheries	1,771	1,104
Manufacturing	16,328	6,640
Mining	396	219
Construction	17,893	4,803
Transportation and Public Utilities	47,515	9,977
Wholesale Trade	8,691	3,749
Retail Trade	40,765	9,993
Finance, Insurance and Real Estate	12,564	3,263
Services	55,893	21,556
Federal Civilian	18,961	1,689
Federal Military	82,206	424
State and Local Government	<u>37,391</u>	<u>26,189</u>
Subtotal	\$370,110	\$115,906
<b>TWO-COUNTY TOTAL</b>		<b><u>\$486,016</u></b>

Note: Earnings reported by place of work.

Source: Bureau of Economic Analysis. Regional Economic Information System, April 1991.

**Table 3.5-4. Summary of Employment and Earnings Related to Cannon AFB**

<i>Category</i>	<u>FY1990</u>		<u>FY1991</u> <sup>a</sup>	
	<i>Employment</i>	<i>Payroll (\$000)</i>	<i>Employment</i>	<i>Payroll (\$000)</i>
Uniformed Military	4,056	\$ 84,688	4,158	\$ 86,817
Appropriated Fund Civilian	459	12,357	512	13,784
NAF/BX/Other Base Civilians	<u>392</u>	<u>3,118</u>	<u>405</u>	<u>3,221</u>
<b>TOTAL</b>	<b>4,907</b>	<b>\$100,164</b>	<b>5,075</b>	<b>\$103,822</b>

Note: a. Employment and payrolls estimated using FY1990 figures and manpower estimates of 4,158 military personnel and 512 appropriated fund civilians.

Source: Economic Resource Impact Statement, FY 1990, Cannon AFB.

**Table 3.5-5. Summary of 1990 Housing in Roosevelt and Curry Counties**

Area	Total Units <sup>a</sup>	OWNER-OCCUPIED			RENTAL		
		Total	Occupied Units	Vacancy Rate	Total	Occupied Units	Vacancy Rate
<b>Two-County Region</b>							
Curry <sup>b</sup>	16,906	9,670	9,313	3.7	6,452	5,800	10.1
Roosevelt	6,902	3,975	3,856	3.0	2,415	2,135	11.6
<b>TOTAL</b>	<b>23,808</b>	<b>13,645</b>	<b>13,169</b>	<b>3.5</b>	<b>8,867</b>	<b>7,935</b>	<b>10.5</b>
<b>SELECTED CITIES</b>							
Clovis	12,978	7,812	7,500	4.0	4,713	4,176	11.4
Portales	4,277	2,280	2,184	4.2	1,870	1,634	12.6

**Notes:** a. Includes housing units such as recreational homes, migrant worker quarters, and other not designated either owner-occupied or rental units.  
b. Includes Cannon AFB.

**Source:** *1990 Census of Population and Housing, Summary Population and Housing Characteristics, New Mexico.* U.S. Bureau of the Census 1991.

one and two bedroom units which were inadequate for 46% of the 600 persons on the current waiting list. For the higher military pay grades, average home prices are relatively affordable, varying between \$50,000 to \$100,000, depending on the size and age of the house (SAIC, 1989). Undeveloped land is inexpensive, utilities are available, and there are few zoning constraints to new home construction.

There are currently 1,841 housing units controlled by Cannon AFB. Unaccompanied enlisted personnel reside in 830 dormitory units on-base. Military families live in 1,011 units, 250 of which are located off-base. Typically, military family housing (MFH) is maintained at 95 percent occupancy, while 5 percent are undergoing repairs and renovations. Construction of additional military housing units is underway (TAC, 1990). A total of 200 new dormitory units were recently completed and an additional 100 are in the design stage; 350 MFH units are currently under construction off-base under a military/civilian partnership (as per section 801 of PL 98-115). An additional 361 MFH units are currently being considered under the Military Construction Program (MCP) for FY 93. If approved, they would likely be available to military families by FY 93/3.

The demand for housing in the region was affected by the recent realignment in FY 91/4. An estimated 155 households came into the area, increasing the demand for owner-occupied houses and rentals. A recent study (FY 92/1) of the Cannon AFB housing market area found that deficits of suitable housing currently exist for specific military grades (SAIC, 1992). In particular, there is a deficit of roughly 300 one-and two-bedroom units and a deficit of 250 three-bedroom units suitable for senior enlisted families.

### 3.5.1.4 Community Services

#### Community Services in the City of Clovis and Curry County

Clovis residents are served by police, fire, ambulance, road maintenance, airport, waste, library, and recreational services provided by the city. The cost of wastewater and solid waste is borne by user fees. Water is supplied directly to residents in and adjacent to the city by a private company (Moss, 1989; Garrett, 1989; personal communication). Wastewater and water services are discussed below in the section on utilities.

The city employs 57 police officers, 32 fire officers, and 31 ambulance officers (Clovis City Budget Fiscal Year 1988-1989). Additionally, the fire department can call on mutual aid agreements with Cannon AFB and the county, if necessary. City response to fire and emergency medical calls extends to county residents within 10 miles of the city. Approximately 84 percent of fire calls and 76% of emergency medical calls are attributed to city residents (Cooper, 1989, personal communication).

Based on a 1989 projected city population of 35,200, there is one police officer for every 618 city residents. Assuming a reduction in the number of officers proportionate to the percentage of calls made outside the city limits, there is one fireman per 1,310 city residents served, and one ambulance officer per 1,494 city residents served.

A variety of municipally funded recreation facilities is available. City facilities and programs are coordinated with those of the school district and of Play, Inc., a nonprofit organization which operates two outdoor pools (a year-round facility is planned) and youth sports programs (Grandy, 1989, personal communication). Voters have recently approved construction of a new library (Moss, 1989; Garrett, 1989; personal communication). Curry County is responsible for county roads; provides sheriff, jail, and drug enforcement services; and collects taxes for the city, state, and schools. Currently, jail capacity is inadequate to meet city and county needs. Plans for a new building have not been approved by voters, and the overflow is housed in the Roosevelt County jail (Bonney, 1989, personal communication).

#### Community Services in the City of Portales and Roosevelt County

Portales residents are served by police, fire, emergency medical services, recreation, solid waste, and road maintenance services. A municipal airport will soon be available for use. In addition to recreational services provided by the city, residents may participate in a variety of cultural activities provided by ENMU, which is located in Portales. User fees cover the cost of wastewater, solid waste, and water services; wastewater and water services are discussed below in the section on utilities.

The city employs 20 police officers, 9 fire officers, and 8 emergency medical personnel. City response to fire and emergency medical calls extends to county residents within 10 miles of the city (Shafer, 1989; Obrey, 1989, personal communication). Approximately two-thirds of fire and emergency medical calls are attributed to city residents, and the other one-third of calls are from county residents (City of Portales, 1989). Based on a 1989 projected population of 10,300, there is one police officer for every 515 city residents, approximately one fire officer per 1,720 city residents served, and approximately one emergency medical officer per 1,930 city residents served.

Roosevelt County is primarily responsible for county roads and for sheriff and jail services. The county jail, built within the last few years, houses inmates for the city of Portales and also the overflow for Curry County and Clovis. Capacity is more than adequate to meet current needs (Dictson, 1989, personal communication).

#### Medical Services

Two general hospitals serve the study area. These are Clovis High Plains Hospital, located in Clovis, and Roosevelt General Hospital, located in Portales. The civilian hospitals provide a total of 152 licensed hospital beds (excluding 57

nursing home beds), to serve a projected 1989 population in the two-county Region of Influence (ROI) of 61,500, yielding a ratio of 1 bed per 405 people. Clovis High Plains Hospital provides a full range of specialty services except for neonatal care. The hospital has adequate capacity to serve current needs. No problems in local recruiting of hospital staff have occurred except for critical nursing areas such as intensive care (Lineberry, 1989, personal communication). Roosevelt Hospital provides community hospital services and general surgery, including some specialty services. Hospital officials believe that capacity is adequate for current needs and could accommodate 30 percent growth without stress (Timmons, 1989, personal communication). Physicians are available locally to cover the range of medical needs, although their numbers per specialty are limited. Patients are referred to hospitals in Lubbock or Amarillo, Texas, each about 2 hours away, or to Albuquerque, about 4 hours away, if specialty services are not locally available (Brewer, 1989, personal communication).

Medical care, including prescriptions and testing, is also provided by the Cannon AFB hospital. Medical services are provided free not only to active duty personnel but also to military retirees and the dependents of active duty and military retirees. Approximately 2,500 military retirees and their dependents, living in the Cannon AFB area, are eligible for these benefits at the base. Hospital statistics indicate that the average waiting time for most services provided on-base is well within USAF standards (Cannon AFB Hospital, 1989).

Specialty services not provided on-base include orthopedics; dermatology; ear, nose, and throat; urology; cardiology; and ophthalmology. Agreements are in place with several military facilities to serve the needs of active duty personnel for services that are not available at Cannon AFB (Brewer, 1989, personal communication). Military retirees and dependents may use civilian services when needed services are not available at the military hospital, and they are assisted with costs through the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). Eligible persons living in the Cannon zip code zone must first seek service at Cannon AFB hospital for inpatient care. In 1987, CHAMPUS assisted an average of fewer than 5 inpatients per day from the Cannon zip code area, indicating that military retirees and dependents generally rely on services provided by the military (CHAMPUS, 1988).

Plans for construction of additional base health facilities for the expected increase in administrative and outpatient needs have been approved. The current hospital staff will be expanded from 250 to 290-330, and approximately 30,000 square feet of additional floor space will be constructed. No additional inpatient facilities are planned (Orille, 1989, personal communication).

### 3.5.1.5 Utilities

Four types of utilities are affected by Cannon AFB: water supply, wastewater treatment, electricity, and natural gas. Overall, utilities maintain a large reserve in the two-county ROI. The base impacts these utilities through direct use and through demand in surrounding communities. Cannon AFB provides its own

water from wells, treats its own wastewater, and does not rely on community utilities for these services. Currently both domestic and industrial wastewaters are treated in sewage treatment lagoons. Presently, the lagoons are undergoing a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and are likely to show that solids are of quantity and type to be classified as toxic wastes, subject to corrective action. A new 1.0 million gallon per day tertiary wastewater treatment facility is scheduled for construction in FY 95 as part of Cannon AFB MILCON program. The new plant will meet New Mexico's wastewater discharge and reuse standards. This facility is not part of the proposed construction projects for the F/EF-111 basing at Cannon AFB. Rural residents also handle their own water and sewage treatment needs.

Water for Clovis and Portales is pumped from the Ogallala aquifer. The New Mexico-American Water Company supplies water to Clovis. Pumping capacity has a 70 percent reserve (Schaffer, 1989, personal communication). Portales city government runs its own water supply system with over a 100 percent reserve. There is ample reserve for expansion.

Portales and Clovis each have their own wastewater treatment systems. The Clovis system has a capacity of 4 million gallons per day (mgpd). The current load is 3.2 mgpd. This is a relatively low reserve (Becker, 1989a, personal communication). Portales is operating at its 1 mgpd capacity. Much of the wastewater is from industrial users. Additional domestic sewage could be handled, since it would dilute the industrial wastewater.

Electricity is supplied to the entire region by the Southwestern Public Service Corporation through a multi-state grid. The company supplies roughly 50,000,000 kilowatt-hours to Cannon AFB every year (Martin, 1989, personal communication). This is only .03 percent of the electricity supplied by the utility. All military-related uses consume less than 1 percent of the utilities' output. The company maintains a large reserve-generating capacity.

Gas is supplied to the two-county ROI by the Gas Company of New Mexico. New Mexico and Texas have large gas reserves. Pipelines serving the ROI operate at only partial capacity, leaving a large reserve. The base is a major consumer, using 13.5 percent of the gas supplied to the two-county area.

### 3.5.1.6 Education

#### Clovis Municipal School District

Clovis Municipal School District operates 13 elementary schools, 3 junior highs, and 1 high school, with a total 40th-day enrollment during the 1989-90 school year of 7,875 students, including kindergarten [prorated as full-time equivalents (FTEs)] and special students (Clovis Municipal School District, 1989b). Students are allocated to schools on a neighborhood basis and divided into elementary (grades 1-6), junior high (grades 7-9), and high school (grades 10-12) (Mitchell, 1989, personal communication). After a small increase each year since the mid-1980s, overall enrollment has decreased nearly 2 percent for the 1988-89

**Table 3.5-6. Clovis Municipal School District Enrollment,  
1985-86 to 1989-90<sup>1</sup>**

School Year	Special Students <sup>2</sup>	Grades				Total
		Kindergarten <sup>3</sup>	1-6	7-9	10-12	
1985-86	262	335.5	3725	1835	1482	7639.5
1986-87	303	350	3770	1825	1578	7826
1987-88	342	339.5	3846	1792	1627	7946.5
1988-89	342	325	4012	1750	1598	8027
1989-90	327	347.5	3977	1689	1534	7874.5

<sup>1</sup> 40th-day count.

<sup>2</sup> Includes special and prekindergarten education.

<sup>3</sup> Full-time equivalent.

Source: Clovis Municipal School District, 1989a; 1989c.

**Table 3.5-7. Projected Enrollment: Clovis Municipal School District 1990-91 to 1991-921**

<b>School Year</b>	<b>Special Students<sup>2</sup></b>	<b>Grades</b>				<b>Total</b>
		<b>Kindergarten<sup>3</sup></b>	<b>1-6</b>	<b>7-9</b>	<b>10-12</b>	
1990-91	346	351	4043	1654	1547	7941
1991-92	366	354	4110	1620	1560	8010

**1** Projections were estimated assuming that each grade group grows at the same average annual percent growth rate observed from 1985-86 to 1989-90, calculated using the following assumptions: Special students at 5.70 percent/year; kindergarten at 0.88 percent/year; 1-6 at 1.65 percent/year; 7-9 at -2.05 percent/year; 10-12 at 0.87 percent. (Tac, 1990)

**2** Includes special and prekindergarten education.

**3** Full-time equivalent.

school year. Past and projected enrollments, including kindergarten and special students, aggregated by elementary, junior high, and high school levels, are shown in Tables 3.5-6 and 3.5-7, respectively. A total of 1,735 student dependents of Cannon AFB personnel, representing approximately 22 percent of total student enrollment, enrolled in Clovis schools during the school year 1989-90 (kindergarten students are prorated as FTEs) (Clovis Municipal School District, 1989b). The Clovis school district is the only one in the study area with a sufficiently large percentage of federally connected students to qualify for PL-874 Federal Education Impact Funds. School districts are entitled to receive PL-874 funds in lieu of property taxes based on the attendance and place of residence of federally connected students enrolled. Distinctions made between "A" students, who reside on-base with a military parent, and "B" students, who live off-base, affect the amount of payment received. For the 1988-89 school year, the district received a total of \$733,925, representing \$745.22 per "A" student and \$43.55 per "B" student. Records for 1989-90 indicate that 981 "A" and 754 "B" student dependents of military personnel were enrolled in Clovis schools (Clovis Municipal School District, 1989b). The school district does not benefit directly from PL-874 payments, 95 percent of which are considered by the state in calculating the state equalization guarantee that provides the overwhelming proportion of school operational funds (Morgan, 1989).

Over 96 percent of the Clovis Municipal School District's operational funds are derived from state sources. Most of the funding is provided by the state equalization guarantee, a formula established by the New Mexico School Finance Act of 1974, under which funding is determined by calculating "program units". Factors used to determine program units include the number of FTE students in membership on the 40th day of school, the grade level (different weights are given according to grade, early childhood, bilingual, and special education students), and school district size (Morgan, 1989).

School districts may levy general obligation bonds, which must be approved by voters, to finance new construction and capital improvements. Bonding capacity is limited to 6 percent of the assessed valuation of property within the district (Morgan, 1989). As of June 30, 1988, the Clovis district had \$5 million in outstanding principal, which represents 2.2 percent of the possible 6 percent bonding capacity (New Mexico State Department of Education, no date).

#### Portales Municipal School District

Portales Municipal School District operates four elementary schools, one junior high, and one high school, with a total enrollment for the 1989-90 school year of 2,639, including kindergarten (prorated as FTEs) and special students (Overby, 1989a, personal communication). Each school serves specific grades; thus, enrollment is city-wide rather than neighborhood-based. Overall enrollment has been exceptionally stable for the past 5 years, with only a small increase in students each year. Growth has occurred primarily in the lower grades; however, kindergarten enrollment appears to have slowed in the past year (Portales Municipal School District, 1989; Overby, 1989b, personal communication). Past and projected 40th-day enrollments are shown in Tables 3.5-8 and 3.5-9,

**Table 3.5-8. Portales Municipal School District Enrollment,  
1986-87 to 1988-89<sup>1</sup>**

School Year	Special Education	Kindergarten <sup>2</sup>	Grades			Total
			1-6	7-9	10-12	
1986-87	91	115	1219	581	466	2472
1987-88	79	116.5	1240	584	490	2509.5
1988-89	77	116.5	1250	626	465	2534.5
1989-90	84 <sup>3</sup>	104	1331	604	516	2639

<sup>1</sup> 40th-day count.

<sup>2</sup> Full-time equivalent.

<sup>3</sup> Projected 80-day count.

Source: Portales Municipal School District, 1989; Overby, 1989a, personal communication.

**Table 3.5-9. Projected Enrollment Without Realignment:  
Portales Municipal School District 1989-90 to 1991-921**

<b>School Year</b>	<b>Special Education</b>	<b>Grades</b>				<b>Total</b>	
		<b>Kindergarten</b>	<b>2</b>	<b>1-6</b>	<b>7-9</b>	<b>10-12</b>	
1990-91	82		100.5	1371	612	534	2699.5
1991-92	80		97	1412	620	552	2761.0

1 Projections were estimated assuming that each grade group grows at the same average annual percentage growth rate observed from 1986-87 to 1988-89, calculated using the following assumptions: Special education at -2.63 percent/year; kindergarten at -3.30 percent/year; 1-6 at 2.97 percent/year; 7-9 at 1.30 percent/year; 10-12 at 3.46 percent. (Tac, 1990)

2 Full-time equivalent.

respectively. In the Spring of 1990, there were only 29 federally connected students in the Portales schools, and the school district does not qualify for PL874 funds. As in Clovis, the overwhelming proportion of operational funds are derived from the state. As of June 30, 1988, the district had an outstanding principal of \$445,000 in bonded debt; this represents 3 percent of the possible 6 percent bonding capacity (New Mexico State Department of Education, no date).

#### Eastern New Mexico University

The Clovis Community College Campus and ENMU Portales campus serve different student needs and are funded separately. The Portales campus offers 4-year undergraduate programs and graduate programs. The Clovis campus offers 2-year undergraduate classes. Clovis Community College works closely with the base to facilitate the transfer of credits for military personnel. Approximately 25 sections of the community college courses are taught on-base. Additionally, the college offers an accelerated 9-week mini-term to accommodate military needs. Total annual FTE enrollment is 1,350. Headcount in the Spring of 1990 was 2,989; 460 students were active duty military, primarily enlisted men. Unofficial estimates are that an additional 100 students are military dependents (Gurley, 1989, personal communication). These data indicate that approximately 19 percent of students are related to Cannon AFB activity.

Current military enrollment at ENMU Portales is lower than at the Clovis campus. Spring enrollment headcount showed 91 undergraduate active military students out of a total undergraduate enrollment of 2,481 and 5 military out of a total 71 graduate students. These numbers represent approximately 4 percent of undergraduate and 7 percent of graduate students. Data on military dependent enrollment were not available (Holt, 1989, personal communication).

#### 3.5.1.7 Public Finance

New Mexico local governments receive operating funds from state distributions, local taxes and charges for services, and federal revenues. A key feature of the New Mexico tax system is the reliance of local jurisdictions on revenues from the state. The overwhelming proportion of state revenue is from the state-wide gross receipts tax. A percentage of this tax is retained by local governments; a higher percentage is retained by the state and subsequently redistributed. Considering gross receipts funding alone, Clovis received \$4,703,595 (64 %) of its 1988 General Fund revenues from this source; Portales received \$2,126,686 (68%) (New Mexico State Department of Finance and Administration, 1988). Other main revenue producers for local communities are federal grants and revenues, local service or use charges, and property taxes. For the city of Portales, service charges account for a larger percentage of revenue than property taxes. For the city of Clovis, service charges contributed more to revenues in 1986-87 than property taxes and slightly less in 1987-88. The state constitution provides that rates of up to \$20 per \$1,000 of net taxable property value may be imposed for general purposes without approval of the electorate; the proportion for municipal and county jurisdictions is \$7.65 and \$11.75, respectively (New Mexico State Department of Taxation and Revenue, 1989).

**Table 3.5-10. Per Capita Revenues and Expenditures, Cities of Clovis and Portales, New Mexico**

City	1986-87 Actual	1987-88 Actual	1988-89 Budgeted
<b>Clovis</b>			
General Fund Revenues	\$7,225,128	\$7,338,013	\$6,994,709
General Fund Expenditures	\$6,367,039	\$7,089,341	\$7,839,768
Estimated Population	33,780 <sup>1</sup>	34,200 <sup>2</sup>	34,700 <sup>3</sup>
Per Capita Revenues	\$214	\$215	\$202
Per Capita Expenditures	\$188	\$207	\$226
<b>Portales</b>			
General Fund Revenues	\$2,980,891	\$3,127,143	\$3,624,397
General Fund Expenditures	\$2,775,751	\$2,981,538	\$3,779,078
Estimated Population	10,180 <sup>1</sup>	10,200 <sup>2</sup>	10,300 <sup>3</sup>
Per Capita Revenues	\$293	\$307	\$352
Per Capita Expenditures	\$273	\$292	\$367

1,2,3 TAC, 1990

Source: New Mexico State Department of Finance and Administration, Local Government Division, 1987; 1988.

Table 3.5-10 shows per capita revenue and expenditure figures for Clovis and Portales for 1986-87 and 1987-88. The cities estimated expenditures of \$7,839,768 and \$3,779,078, respectively, for 1988-89. Per capita expenditures are \$226 for Clovis based on a projected 1988 population of 34,700. Portales projects a \$367 per capita expenditure on a population of 10,300 for the same period (New Mexico State Department of Finance and Administration, 1988).

The ability of local governments to issue debt is subject to rules established by the New Mexico state constitution, generally through limitations on the amount of debt jurisdictions may have, expressed as a percentage of taxable property values (New Mexico State Department of Taxation and Revenue, 1989). Thus, the cities of Clovis and Portales have a limit of 4 percent of assessed property value on the amount of debt they are able to levy. Both cities are financially sound, with relatively small debt obligations. Both have available their full General Obligation bonding capacity. Currently, Portales has \$2,369,319 available; Clovis has \$8,117,569 available. The amount available in future years will vary with the assessed value of property.

### 3.5.1.8 Transportation

The highway network in the vicinity of Cannon AFB consists of U.S., state, city, and county roads. The nearest interstate highway, I-40, is located approximately 50 miles to the north of Clovis. Figure 3.5-1 shows the general orientation of the road network in the study area.

Three U.S. highways (U.S. 60, U.S. 70, and U.S. 84) account for the majority of the through-traffic in the county. These three highways enter Clovis from the east on a combined alignment. U.S. 70 branches off to the southwest in the center of town and U.S. 60/84 continues west as a four-lane divided highway. Cannon AFB is located adjacent to U.S. 60/84, approximately 6.75 miles west of the city center. Connecting highways include state roads 311 and 467, two-lane roads in the immediate vicinity of the base, and 7th Street, where traffic through the city is most concentrated.

In general, the road network in the vicinity of the base appears to have adequate reserve capacity to accommodate increased traffic. U.S. 60/84 carries almost 1,300 vehicles per day on the section between Clovis and the base; approximately 40 percent reserve capacity is available during the peak traffic hour. A possible problem area is the base interchange on U.S. 60/84. Although insufficient information was available to perform a detailed capacity analysis for the interchange, a preliminary analysis indicates that the maximum hourly capacity of 1,500 vehicles may be approached under current conditions. During peak traffic periods, vehicles currently back up on the westbound exit ramp, waiting to enter the base main gate, located south of the highway. The queue often extends back into U.S. 60/84 as far as 3 miles. This is true especially during base recalls. The new West Gate should alleviate most of this traffic backlog; it will not become operational, however until 1993 when the state completes the installation of a railroad crossing gate.

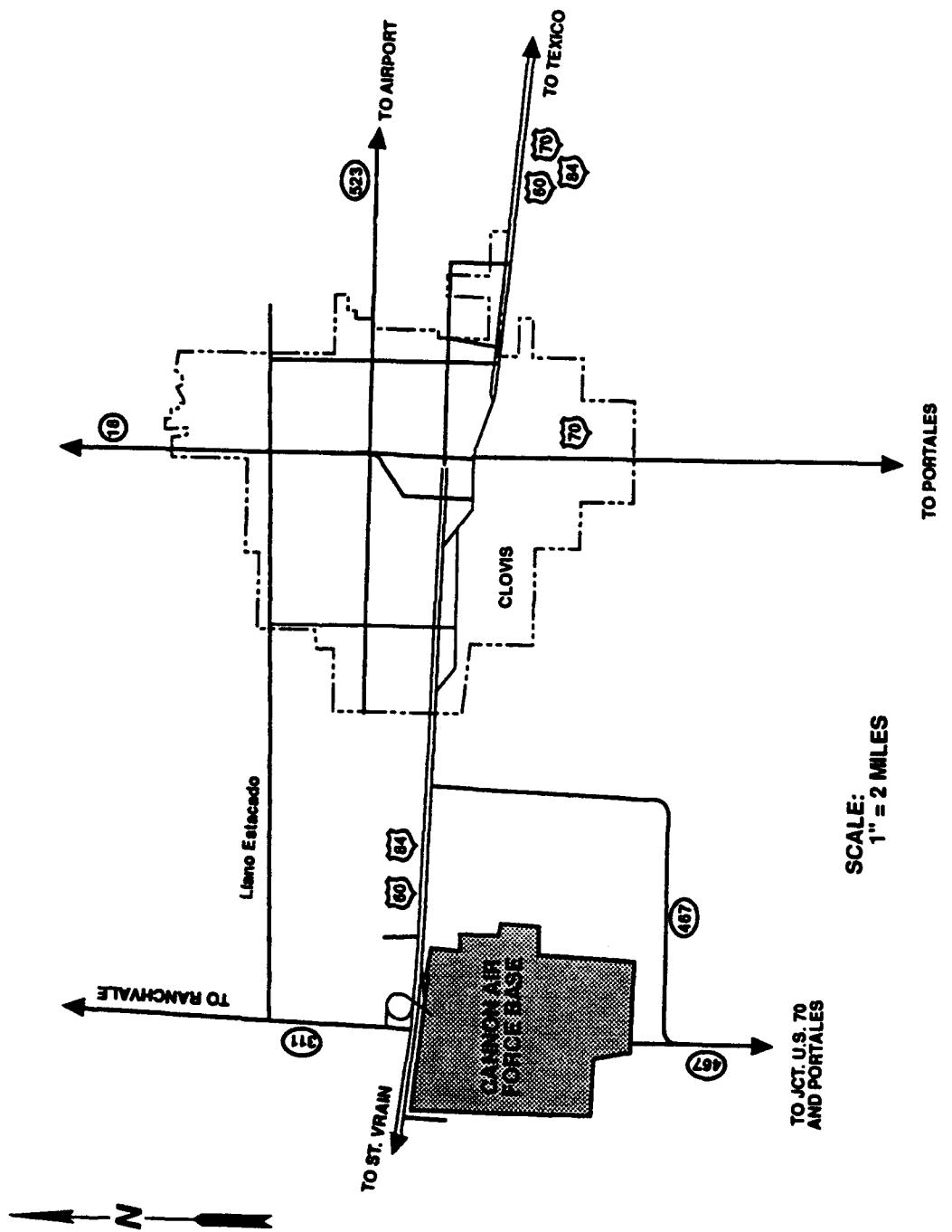


Figure 3.5-1. Road Network in the Cannon AFB Area

This problem may be alleviated by the recently completed West gate which opens to a county road leading to U.S. 60/84. The county road is in poor condition but has recently been chip-sealed by the county. The ultimate goal is to upgrade the road to a four lane with a traffic signal located at a problem railroad crossing. This proposal is currently in the governor's office, but action on it is not expected until November 1992, at the earliest. Traffic along SR-311 and SR-467 is relatively light, averaging under 2,000 vehicles per day (Dick, 1989, personal communication). Reserve capacity for these roads is at least as high as for U.S. 60/84. Within Clovis, the traffic diffuses through the city street network, such that impacts to streets other than 7th Street are minimal. Along 7th Street, a four-lane divided urban arterial through its intersection with Main Street, maximum average daily traffic was 12,737 in 1986. City officials report no significant traffic congestion problems (Becker, 1989b, personal communication). County roads carry relatively little traffic because of the sparse population.

### **3.5.2 Selected MTRs**

Aircraft stationed at Cannon AFB travel along a network of MTRs located throughout the southwest United States. As described in Section 3.4, this network criss-crosses the airspace of New Mexico, Arizona, and small portions of Colorado and Oklahoma. Much of the land area beneath these routes is used for grazing or agricultural purposes, though a number of routes pass over parks and recreational areas. Population densities beneath the MTRs are very low, ranging from an average of 0.4 persons per square mile in Harding county to 29 persons per square mile in Curry county.

### **3.5.3 Melrose Range**

The Melrose Range is located in the east central corner of New Mexico. It consists of restricted airspace above Curry, De Baca, and Roosevelt Counties, and a 77,000 acre bombing range in Curry and Roosevelt Counties. These counties are sparsely populated, particularly in the vicinity of the Range. There are an estimated 74 persons within the Ldn 65 dB noise contour of the Range (TAC, 1990).

### **3.5.4 Red Rio Range**

Red Rio Range is located in Lincoln County, south central New Mexico. The population of Lincoln County is 12,219 persons, which gives a population density of 2.5 persons per square mile. Red Rio Range is located within the WSMR and has no inhabitants.

### **3.5.5 Oscura Range**

Oscura Range is adjacent to Red Rio Range in Lincoln County. As noted for Red Rio Range, this is a very sparsely populated area. The Range itself has no inhabitants.

### **3.5.6 Mount Dora MOA**

The area underlying the Mount Dora MOA includes parts of Union, Harding, Colfax, and Mora counties in New Mexico. The largest community beneath the MOA is Clayton, New Mexico, which has a population of roughly 3,000 persons. Overall, the area beneath the MOA is sparsely populated, with an average population density of fewer than 4 persons per square mile. Towns and their populations beneath the Mount Dora MOA are shown in Table 3.5-11.

### **3.5.7 Pecos MOA**

The area underlying Pecos MOA includes parts of De Baca, Chaves, Guadelupe and Lincoln Counties. Population densities are very low beneath this MOA, ranging from fewer than 1 person per square mile in De Baca County to 3.5 persons per square mile in Chaves County.

## **3.6 BIOLOGICAL RESOURCES**

### **3.6.1 Cannon AFB**

#### **3.6.1.1 Plant Resources**

Cannon AFB lies within the Great Plains Shortgrass Prairie Province, as defined by Bailey (1980) (Figure 3.6-1). The undisturbed natural vegetation of the province is mostly shortgrass prairie, dominated by buffalograss and blue Grama grass. These shortgrasses are usually bunched and sparsely distributed. Scattered trees and shrubs occasionally appear in this steppe environment. In much of the area the soil is exposed.

Much of the area in the immediate environs of Cannon AFB has been previously cleared for agricultural crops and little natural vegetation remains. The predominant land use of the region is rangeland, primarily for cattle grazing. In general, moderately grazed rangeland areas of the types occurring in the project area are highly productive in terms of both forage quality and quantity. The rangeland in the vicinity may support up to 15 to 20 head of cattle per section, depending upon the rainfall. Large trees are not normally found in the area except where planted around buildings and other structures on the base. Woodlands composed of large shrubs and small trees are confined to riparian areas and playa lakes in the vicinity.

#### **3.6.1.2 Wildlife Resources**

The eastern New Mexico area contains many nongame wildlife species typical of the High Plains. Most of these species are distributed widely throughout the western United States. Because of the low vegetation diversity, species diversity is low in most habitats. Most amphibian species are associated with riparian habitats and playa lakes. Reptiles are found in all terrestrial habitat types but are most abundant in scrub/grasslands. Nocturnal rodents are the most abundant members of the small mammal community.

**Table 3.5-11 Population and Population Densities Beneath  
Mount Dora MOA**

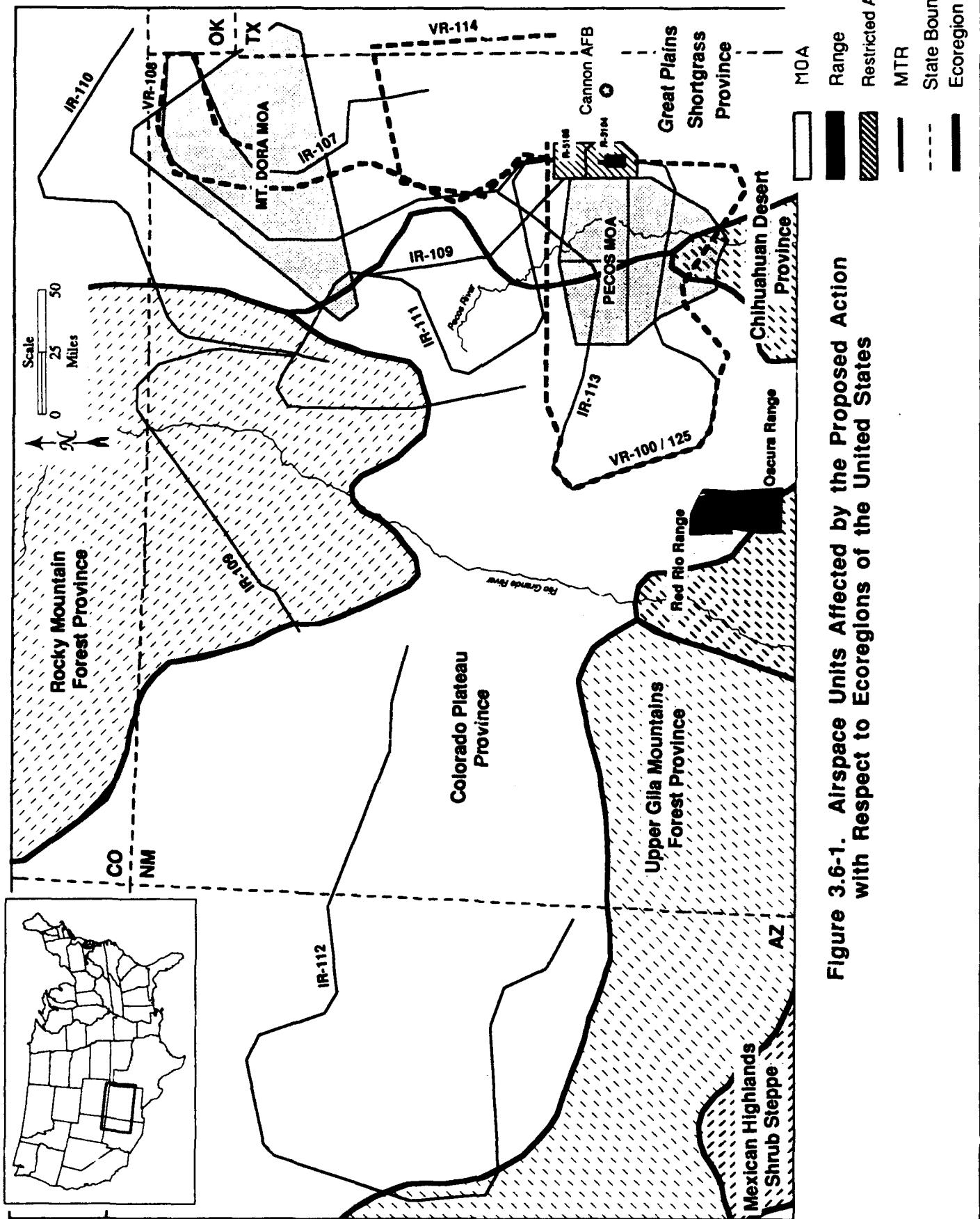
Town	<u>New Mexico</u>		Population
	County		
Abbott	Colfax	Rural <sup>2</sup>	
Bueyeros	Harding	10	
Capulin	Union	50	
Chico <sup>1</sup>	Colfax	Unknown	
Clapham	Union	Rural	
Clayton <sup>1</sup>	Union	2968	
Des Moines	Union	178	
Farley	Colfax	30	
Folsom	Union	73	
Gladstone	Union	5	
Grande	Union	no population <sup>3</sup>	
Grenville <sup>1</sup>	Union	39	
Levy	Mora	Rural	
Mills	Harding	15	
Mount Dora	Union	5	
Roy <sup>1</sup>	Harding	381	
Royce	Union	no population	
Sedan	Union	40	
Shoemaker	Mora	no population	
Sixela	Union	no population	
Seneca	Union	5	
Sofia	Union	Rural	
Staunton	Union	no population	
Stead	Union	5	
Wagon Mound <sup>1</sup>	Mora	416	
Valmora	Mora	45	
Taylor Springs	Colfax	Rural	
<u>Texas</u>			
Perico	Dallam	Rural	
Texline	Dallam	477	

<sup>1</sup> These towns are incorporated

<sup>2</sup> "Rural" indicates open country localities that have a locally recognized name, although no built-up section exists

<sup>3</sup> "No population" indicates the existence of railroad stations or mines, not associated with any settlement.

Source: Rand McNally & Co. 1986, Commercial Atlas & Marketing Guide, 17th Edition, Chicago



**Figure 3.6-1. Airspace Units Affected by the Proposed Action with Respect to Ecoregions of the United States**

Grasslands on the High Plains support a variety of seed-eating sparrows and other ground-dwelling birds, both as residents and migrants. Raptors (hawks and owls) are relatively abundant in all habitats in the region with insectivorous and tree-nesting species most abundant in riparian areas. Shorebirds, waterbirds, and migratory waterfowl in general use the rivers, playa lakes, and reservoirs of the region. Playas (playa lakes) in eastern New Mexico are important nesting, feeding, and grouping areas for migratory waterfowl, shorebirds, raptors, songbirds, upland game birds, and many other species of wildlife. Bald eagles, geese, and ducks winter at the Ute, Conchas, and Santa Rosa reservoirs. Portions of Ute Reservoir are used as a migratory bird sanctuary. In addition to providing habitat for migratory birds, playa lakes also provide habitat for endemic mammals, amphibians, and reptiles.

Two NWRs are located on the periphery of the base area. The Grulla and Muleshoe NWRs, within 30 miles of Cannon AFB, provide high-quality habitat for migratory and breeding waterfowl.

Big-game species in the area include mule deer, white-tailed deer, pronghorn, and barbary sheep, with the pronghorn the most abundant game animal. Several species of upland game, such as quail, ring-necked pheasant, and turkey are common in the area. Reservoirs (Ute Lake, Conchas Lake, and Clayton Lake) and playa lakes are important waterfowl habitats in the region.

### 3.6.1.3 Protected Species

Table 3.6-1 and 3-6.2 summarizes the species present in the area that receive federal or state protection. Appendix E provides a summary of information concerning species in the area affected by the project, which have been given federal threatened or endangered status. Also provided is information on species designated as "Category 2 Candidates" which may be found in the affected area. No federally protected endangered plants are known to be present on the base. The following candidate species of plants are found within a 50-mile radius of Cannon AFB: chatterbox orchid, dune unicorn plant, and the tall plains spurge. Two federally listed endangered animal species, the bald eagle and peregrine falcon, are known to inhabit the area within a 50-mile radius of Cannon AFB. The federally listed black-footed ferret may also occur in the vicinity of the base. The bald eagle migrates and winters from the northern border of New Mexico to the Gila, lower Rio Grande, middle Pecos, and Canadian valleys. It is seen occasionally in summer and as a breeding bird, with nests reported in the extreme northern and western parts of the state. Winter and migrant populations appear to have increased with reservoir construction. The peregrine falcon is widely distributed but population numbers are low. The American subspecies breeds statewide in New Mexico but mainly west of the eastern plains. No information is available on the presence of the black-footed ferret in New Mexico. The Pecos blunt nose shiner, a threatened species, is found in the Pecos River from Santa Rosa to Antesia. The Mexican spotted owl, a candidate threatened species, is found primarily in coniferous biomes, but also in pinyon-juniper, pine-oak and ponderosa biomes.

**Table 3.6-1**  
**Federal Protected Species Present**  
**Within the Area Affected by the Proposed Action**

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
<b>Fish</b>		
Pecos blunt nose shiner	<u>Notropis simus pecosensis</u>	T
Arkansas River shiner	<u>Notropis girardi</u>	C2
Rio Grande shiner	<u>Notropis jemezanus</u>	C2
White Sands pupfish	<u>Cyprinodon tularosa</u>	C2
<b>Reptiles</b>		
Sacramento mountain salamander	<u>Aneides hardii</u>	C2
Boreal western toad	<u>Bufo boreas boreas</u>	C2
Texas horned lizard	<u>Phrynosoma cornutum</u>	C2
<b>Birds</b>		
Bald eagle	<u>Haliaeetus leucocephalus</u>	E
American peregrine falcon	<u>Falco peregrinus</u>	E
Interior least tern	<u>Sterna antillarum anthalassos</u>	E
Aplomado falcon	<u>Falco femoralis septentrionalis</u>	E
Whooping crane	<u>Grus americana</u>	E
Mexican spotted owl	<u>Strix occidentalis lucida</u>	T**
Southwestern willow flycatcher	<u>Empidonax traillii extimus</u>	C2
Ferruginous hawk	<u>Buteo regalis</u>	C2
Apache northern goshawk	<u>Accipiter gentilis apache</u>	C2
Long-billed curlew	<u>Numenius americanus</u>	C2
Western snowy plover	<u>Charadrius alexandrinus nivosis</u>	C2
Mountain plover	<u>Charadrius montanus</u>	C2
White-faced ibis	<u>Plegadis chihi</u>	C2
<b>Mammals</b>		
Black-footed ferret	<u>Mustela nigripes</u>	E
Greater western mastiff bat	<u>Eumops perotis californicus</u>	C2
Occult little brown bat	<u>Myotis lucifugus occultus</u>	C2
Spotted bat	<u>Euderma maculatum</u>	C2
Arizona black-tailed prairie dog	<u>Cynomys ludovicianus arizonensis</u>	C2
New Mexican jumping mouse	<u>Zapus hudsonius luteus</u>	C2
Swift Fox	<u>Vulpes velox</u>	C2

\* E-Endangered

T-Threatened

C2-Category 2 Candidate

\*\* Proposed as Threatened on Nov. 4, 1991

**Table 3.6-2**  
**State Protected Species Present**  
**Within the Area Affected by the Proposed Action**

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status*</u>
<b>Mollusks/Crustaceans</b>		
Linnaeus' ramshorn snail	<u>Gyraulus crista</u>	E
Raymond's pea-clam	<u>Musculum raymondi</u>	E
Circular pea-clam	<u>Musculum patemium</u>	E
Wide pea-clam	<u>Musculum transversum</u>	E
Roswell Spring snail	<u>Anodona imbecillis</u>	E
Koster's Spring snail	<u>Tryonia kosteri</u>	E
Pecos Assiminea	<u>Assiminea pecos</u>	E
Noel's amphipod	<u>Gammarus desperatus</u>	E
<b>Fish</b>		
Southern redbelly dace	<u>Phoxinus erythrogaster</u>	E
Suckermouth minnow	<u>Phenacobius mirabilis</u>	E
Arkansas River shiner	<u>Notropis girardi</u>	E
Speckled chub	<u>Hypobasis aestivalis</u>	E
Pecos blunt nose shiner	<u>Notropis simus</u>	E
Pecos pupfish	<u>Cyprinodon pecosensis</u>	E
Pecos gambusia	<u>Gambusia nobilis</u>	E
Greenthroat darter	<u>Etheostoma lepidum</u>	E
Bigscale logperch	<u>Percina macrolepidota</u>	E
Brook stickleback	<u>Culaea inconstans</u>	EE
White Sands pupfish	<u>Cyprinodon tularosa</u>	E
<b>Reptiles</b>		
Western ribbon snake	<u>Thamnophis proximus</u>	E
Blotched water snake	<u>Nerodia erythrogaster</u>	E
Sagebrush lizard	<u>Sceloporus graciosus</u>	E
Sacramento Mountain salamander	<u>Aneides hardii</u>	E
<b>Birds</b>		
Bald eagle	<u>Haliaeetus leucocephalus</u>	E
White-tailed ptarmigan	<u>Lagopus leucurus</u>	E
Peregrine falcon	<u>Falco peregrinus</u>	E
Interior least tern	<u>Sterna antillarum anthalassos</u>	E
Aplomado falcon	<u>Falco femoralis septentrionalis</u>	E
Baird's sparrow	<u>Ammodramus bairdii</u>	E
Whooping Crane	<u>Grus americana</u>	E
Bell's vireo	<u>Vireo bellii</u>	E
Olivaceous cormorant	<u>Phalacrocorax olivaceous</u>	E
Piping plover	<u>Charadrius melanotos</u>	E
Boreal owl	<u>Aegolius funereus</u>	E
Common black-hawk	<u>Buteogallus anthracinus</u>	E
Willow flycatcher	<u>Empidonax traillii</u>	E
Broadbilled hummingbird	<u>Cynanthus latirostris</u>	E
Gray vireo	<u>Vireo vicinior</u>	E
<b>Mammals</b>		
Pine marten	<u>Martes americana</u>	E
Least shrew	<u>Cryptotis parvus</u>	E
Colorado Chipmunk	<u>Gutamias quadrivittatus</u>	E
<b>Plants</b>		
Chatterbox orchid	<u>Epipactis gigantea</u>	E
Dune Unicorn plant	<u>Proboscidea sabulosa</u>	S
Tall Plains spurge	<u>Euphorbia strictior</u>	S

\*E-Endangered

S-Sensitive

### 3.6.2 MTRs

Most of the affected MTRs overlie land within the Great Plains Shortgrass Province defined by Bailey (1980). The biota of the underlying land is, therefore, generally similar to that described for the environs of Cannon AFB. The Canadian and Pecos River drainages are significant additional biological features of the area to the west and north of Cannon AFB and Melrose Range. Despite the arid nature of the land, major riparian and wetland habitats are associated with these drainages. Wetlands and reservoirs on the rivers are important winter habitat for a large number of species of duck, geese, and wading birds, while muskrat, beaver, and raccoon are found in the larger rivers. In addition, small riparian zones are scattered throughout the region in association with isolated springs. VR-100/125 passes within 5 statute miles of Bitter Lake NWR on the Pecos River northeast of Roswell. The area is noted for substantial concentrations of wild fowl. Several other MTRs cross the Pecos River drainage basin further north. These include IR-107, IR-111, IR-113, VR-108, and VR-114. IR-109 passes just south of Monte Vista/Alamosa NWR near Alamosa, Colorado, and is a principle stopover for whooping cranes. Many of the MTRs traverse the north-south oriented mountain ranges in the region, used as flyways for migrating raptors, as well as for essential nesting and foraging habitat. These ranges include the Sangre de Cristo range of north central New Mexico, the Capitan, Sacramento, and White Mountains of south central New Mexico, and the Mogollon Plateau of eastern Arizona. The Apolomado falcon, a federally-listed endangered species, is found in the open woodland, savannah, or grassland areas. This species is occasionally observed in the southern half of New Mexico.

The Canyon Colorado Equid Sanctuary (CCES) underlies both a portion of IR-107 and the Mount Dora MOA. CCES is located on the western bank of the Canadian River, approximately 10 miles southeast of Wooton, New Mexico. The privately managed sanctuary specializes in raising endangered equid species. The species present in the sanctuary include Grevy's Zebra, the Wild Somali Ass, and Przewalski's Horse.

Several of the affected MTRs (e.g., IR-111, IR-112, IR-113, VR-100, and VR-125) extend west into the Colorado Plateau Province. Arid Grama grasslands are characteristic at the lowest elevations. The shortgrass sod rarely covers the ground completely and, as in the area near Cannon AFB, there are many bare areas. Sagebrush is dominant in many areas. The affected MTRs are clustered primarily in the southern reaches of the province where yucca and several kinds of cacti are common. Cottonwoods are characteristic along some of the permanent streams. Higher elevations develop woodland zones dominated by open stands of pinyon pine and several species of juniper. Wildlife is generally similar to that found in the Great Plains Shortgrass Prairie Province. The pronghorn antelope is the primary large mammal of the arid grasslands. Other large mammals found in the area include mule deer, mountain lion, coyote, and bobcat.

IR-109 and portions of IR-110 and IR-111 lie within the Rocky Mountain Forest Province defined by Bailey (1980). The area is semiarid, though total precipitation is greater than in the grassland steppes to the south and east. As a result, trees are more abundant in this area. Ponderosa pine is generally dominant on the lower, drier, more exposed slopes while Douglas fir prevails on the higher, more moist, and more sheltered slopes. Along the southern boundary of the province, in the area specifically overflowed by the above MTRs, pinyon-juniper associations frequently alternate with ponderosa pine, depending on slope exposure. Common large mammals of the area include elk, deer, mountain lion, bobcat, and black bear. Hawks and owls are common over most of the region. The Mexican spotted owl, a candidate species, is found in these areas.

### **3.6.3 Melrose Range**

#### **3.6.3.1 Plant Resources**

Melrose Range also lies within the Great Plains Shortgrass Prairie Province, as discussed for Cannon AFB (Section 3.6.1). The plant resources on Melrose Range are similar to those present around Cannon AFB. In general, the Range lacks plant and habitat diversity. Vegetation consists mainly of shortgrass plains interspersed with low mesas. A sandhill area is located at the northernmost boundary and is dominated by an association of sand sagebrush and bluestem grasses.

#### **3.6.3.2 Wildlife Resources**

The wildlife resources on the Melrose Range are similar to those present around Cannon AFB. Certain portions of the Melrose Range have been leased to local cattle producers for grazing purposes. Grazing is regulated by an established grazing plan designed to protect the ecosystem yet provide optimum beef production.

#### **3.6.3.3 Protected Species**

A pair of golden eagles, protected under the Bald and Golden Eagle Protection Act, currently nest on Melrose Range (Jim Richards, 1992). Information on protected species of plants and animals that may be present on Melrose Range are presented in Table 3.6-1 and 3.6-2.

### **3.6.4. Red Rio Range**

Red Rio Range lies within the Colorado Plateau Province defined by Bailey (1980) and presented in Section 3.6.2. The Oscura Mountains lie along the western boundary of the Range; pinyon-juniper woodland is characteristic of the slopes of these mountains. Thus, the vegetation of the Range grades from shortgrass prairie in the east to pinyon-juniper in the west.

### **3.6.5 Oscura Range**

The biota of Oscura Range is comparable to that of Red Rio Range, which lies immediately to the north. The vegetation of the Range grades from shortgrass prairie in the east to pinyon-juniper in the west.

### **3.6.6 Mount Dora MOA**

The land underlying Mount Dora MOA is semiarid and characterized by level plains, plateaus, and low mountains. The vegetation belongs to the Great Plains Shortgrass Prairie Province, as discussed for Cannon AFB (Section 3.6.1). Higher elevations in the area are characterized by pinyon-juniper woodlands. Riparian gallery forests line the major rivers and streams of the region.

Protected species present in the area underlying Mount Dora MOA are presented in Table 3.6-1 and 3.6-2. Two federally listed endangered animal species, the bald eagle and the peregrine falcon, are known to inhabit the area. The federally listed endangered whooping crane and black-footed ferret may occur beneath the MOA, although their occurrence is unlikely. The bald eagle and the state-protected white-tailed ptarmigan are known or are highly likely to occur regularly in the New Mexico counties under the MOA. The bald eagle is seen occasionally in summer in the four counties under the MOA. Winter and migrant populations appear to have increased with reservoir construction. The white-tailed ptarmigan is becoming rare in New Mexico, due probably to livestock and recreational use of tundra habitats in wilderness areas. The whooping crane was formerly widespread in North America but now breeds only in the Wood Buffalo National Park in the Northwest Territories. The bird migrates through the Great Plains to winter on the Texas coast at Aransas NWR. An experimental population has been produced at Grays Lake NWR, Idaho, and these birds migrate southward to winter in the central Rio Grande Valley in New Mexico. This New Mexico population had increased to a total of 32 in 1983-84.

### **3.6.7 Pecos MOA**

The biota of the land underlying Pecos MOA is, for the most part, characteristic of the Great Plains Shortgrass Prairie Province as described in Section 3.6.1. To the west, portions of Pecos MOA overlie the Colorado Plateau Province, as described in Section 3.6.2. Pecos MOA lies above the Pecos River. Bitter Lake NWR, winter home to tens of thousands of ducks, geese, and cranes, lies immediately to the south of the portion of the MOA known as "Pecos High MOA"; the floor of Pecos High MOA is at 11,000 feet MSL (roughly 5,000 to 7,000 feet AGL).

## **3.7 WATER RESOURCES**

Review of the proposed action indicates potential impact to water resources at Cannon AFB. Water resources of other areas (e.g., the affected MOAs, Ranges,

and MTRs) are unlikely to be affected by this action. The following discussion characterizes water resources in the vicinity of Cannon AFB.

### **3.7.1 Surface Water**

Cannon AFB is located in a region that has a semiarid climate with an average annual precipitation of about 16 inches occurring mostly during summer thunderstorms. There is a large potential deficit (53 inches) in precipitation (average annual precipitation minus mean annual lake evaporation) for the Cannon AFB area.

The dominant surface water features in the area around Cannon AFB are small temporary lake basins known as playas. A playa (Playa Lake) at the southwest corner of Cannon AFB collects the majority of the stormwater runoff from the base. There are two wastewater stabilization lagoons on-base. The lagoons have a combined surface area of 32 acres and are operated in series. The treated effluent from the lagoons is channeled to an adjoining on-base playa. Final effluent disposal is by a combination of evaporation, infiltration, and sale to a local farmer for irrigation purposes. The wastewater treatment system does not need a National Pollutant Discharge Elimination System (NPDES) permit since the requirement for an NPDES permit was waived in 1975. Cannon AFB has no permanent surface water features.

Regional drainage in Curry County is predominantly to the southeast and east. Stream drainage is poorly developed because of the low annual rainfall and the minimal relief. The drainage patterns consist of long shallow valleys, locally termed "draws," that extend almost from the western edge of the Southern High Plains to the eastern boundary of the plateau. The draws eventually drain into one of three major river valleys: the Red, the Brazos, or the Colorado. Although the draws extend to the river valleys as drainage systems, they seldom contribute actual flow to the rivers except during periods of unusually high rainfall. The bulk of the precipitation is lost to evapotranspiration and infiltration before it has a chance to run off. In areas not drained by the draws, the playa lakes serve as low-point collection areas for surface runoff. The playas have no surface outlet, and any water they collect is eventually lost to evapotranspiration and infiltration.

### **3.7.2 Groundwater**

There is no permanent surface water on the High Plains near Cannon AFB; therefore, water supplies for irrigation, industrial, and domestic purposes are obtained exclusively from groundwater. Groundwater occurs under unconfined conditions at Cannon AFB. The base is underlain by a portion (locally called the Ogallala aquifer) of the regionally important High Plains aquifer developed in the unconsolidated sediments of the Ogallala Formation. The major source of recharge to the Ogallala aquifer in the Southern High Plains area is precipitation. The amount of potential surface recharge to the aquifer below the base is quite low (1.0 inches per year; EPA, Drastic, April 1987) due to the low annual rainfall coupled with high rates of evapotranspiration.

Groundwater below Cannon AFB generally flows east and southeast. The slope of the water table is relatively flat at 7 to 15 feet per mile. This inclination corresponds with the regional dip of the Ogallala Formation, which is 10 to 15 feet per mile in the area around Cannon AFB. Withdrawals (pumping for irrigation, industry, and domestic use) of large amounts of water from the Ogallala have reduced the water in storage, a process called water mining (U.S. Geological Survey, 1965). Groundwater levels in the vicinity of Clovis and Portales declined 1 to 2 feet per year in the decade preceding 1972 (Galloway, 1972; Taylor and Pitt, 1972). Water levels in the wells at Cannon AFB have declined an average of 1.2 feet per year (William Matotan and Associates, 1985). Well No.7, which is pumped more than the other Cannon wells, exhibits the greatest rate of decline: 1.9 feet per year for the period 1967-1985. Well No.1 exhibits the largest decline in water level: 39 feet over the period 1942-1984. A water well master plan survey conducted in 1985 (William Matotan and Associates, 1985) determined the anticipated useful life of the water wells at Cannon AFB. The results of that study indicate that the existing wells in active use have a remaining useful life of from 5 to 45 years.

In the area around Cannon AFB, the quality of the water from the Ogallala is typically hard, approximately 185 mg/L as calcium carbonate; it commonly contains 2.2 mg/L of fluoride and 350 mg/L total dissolved solids (Galloway, 1972). Analyses of water samples taken from Cannon AFB wells were performed in 1985. Fluoride in untreated well water at Cannon AFB ranges from 1.4 to 2.6 mg/L and total dissolved solids range from 385 to 478 mg/L.

Groundwater is the sole source of water for the Cannon AFB water system. The base water system consists of wells, pumping stations, treatment facilities for disinfection, storage, and a distribution system. The existing base water system provides all of the water for Cannon AFB and provides service only within the base boundaries. The service area includes aircraft operation and maintenance, base housing, recreation facilities (golf course), and general base operation and maintenance. Irrigation accounts for approximately 25 percent of on-base water use in the peak-day summer demands. Base water is supplied by seven wells developed in the Ogallala aquifer. The well depths vary from 357 to 415 feet, with capacities from 200 to 765 gallons per minute (gpm). Water pumped from the wells is stored in reservoirs prior to treatment and distribution (William Matotan and Associates, 1986). In 1984, these wells produced approximately 467 million gallons at an average daily rate of 1.3 million gallons (William Matotan and Associates, 1985).

### **3.8 ARCHAEOLOGICAL RESOURCES AND NATIVE AMERICAN VALUES**

#### **3.8.1. Archaeological, Cultural, and Historical Resources**

##### **3.8.1.1 Cannon AFB**

Numerous cultural resource surveys have been conducted in the vicinity of Cannon AFB, although only one significant study has taken place on the base itself (Trierweiler, 1988). The majority of Cannon AFB itself has been urbanized or subjected to extensive disturbance. A class III cultural resource inventory in 1988 (Trierweiler, 1988) surveyed 388 acres of the base (10.5 percent) in six separate and noncontiguous parcels. These plots were less disturbed than the remainder of the base. Four archaeological sites and two isolated occurrences were recorded, a density of one archaeological site per 97 acres. The archaeological sites consist of two prehistoric chipped stone artifact scatters and one historic Euro-American site older than 50 years. The historic site consists of old foundations and debris from the 1920s and 1930s. This site probably results from the operations of transcontinental air transport. The function of the site is unknown. Military use of Cannon AFB began in 1942. Some buildings of this period remain, but their historical significance is unknown (Williams, 1989, personal communication).

##### **3.8.1.2 Affected MTRs**

VR-100 and VR-125 overlie the Gran Quivira Unit of Salinas Pueblo Missions National Monument in New Mexico. Mogollon Indians occupied the Gran Quivira area from about A.D. 800 to 1675, when severe drought and Apache raids forced their evacuation. Artifacts uncovered here demonstrate the influence of the Pueblo Indians and the Spanish on Mogollon culture. The earliest Native American community in the monument, constructed about 1300, was a single-story rectangular masonry unit. Later, larger one-story and multistory buildings were built on the ridge and, by the 1600's, this pueblo was the largest in the region. Standing atop one of the ridges is the 17th-century Franciscan church, San Buenaventura. Beside it is the Pueblo de las Humanas, surrounded by yet another Franciscan church, San Isidro.

IR-112 lies over the Wupatki National Monument in Arizona. The red sandstone prehistoric pueblos of Wupatki were built by groups of farming Native Americans who settled here following a local environmental disturbance. These ruins constitute the tangible remains of an 11th-century Native American "land rush" that resulted from increased soil fertility caused by the eruption of Sunset Crater, a nearby volcano, in 1065. The area includes several large pueblos, a masonry and one other ball court, and an open-air amphitheater. Nearly 800 sites are located within the area.

### 3.8.1.3 Melrose Range

The Melrose Range and surrounding areas have been used by man for many millennia. Paleo-Indians hunted in the Llano Estacado as long as 10,000 years ago. A famous Paleo-Indian site, the Clovis site, lies east, outside of the Range along Blackwater Draw, which crosses the northern edge of the Range. Later, a variety of Native American groups exploited the region. During the historic period, Native American, Spanish, and Euro-American traders and settlers traveled the Jim Stinson/Comanchero Trail. This trail crosses the northern portion of the Melrose Range.

Numerous cultural resource surveys have been conducted in and near the Melrose Range. These have looked at only small part of the Range. A recent study was a major survey and test excavation project funded by the Air Force (Mariah Associates, 1988). This project assessed impacts to cultural resources from Range expansion and provided guidance for managing those impacts.

Since the whole Range could not be examined in detail, the Mariah survey sampled a representative 12.9 percent (9,940 acres) of the expansion area. Sixty-two sites and 195 isolated occurrences were located. Analyses of these sites show that the Melrose Range area has been used from Folsom to historic homestead times, a span of over 10,000 years. During prehistoric periods, a wide variety of hunting and gathering groups used the area. Sites are mainly found near the edge of the Llano Estacado, in dune deposits in valleys, along ephemeral arroyos and channels, and adjacent to playa lakes. The Jim Stinson/Comanchero Trail passed by these playa lakes, which provided fresh water. Intensive historic settlement on the Range occurred during the late 1800s. Droughts and the 1930s Depression greatly reduced the number of settlers. One historic site is the Boys Ranch Property. This complex was known as the Old Hart Headquarters in homesteading times. The property is adjacent to the present Range (Williams, 1989, personal communication). Another historic property is the Greathouse Ranch in the southeastern corner of the Range.

Sites located during the Mariah study were also evaluated for their research potential. Sites with significant research potential are eligible for listing on the National Register of Historic Places (NRHP). Of 62 sites considered, 19 demonstrated significant research potential, 6 had only minor research potential, and 37 required further investigation to determine their significance.

### 3.8.1.4 Red Rio and Oscura Range

Kirkpatrick's (1987) survey of the Red Rio and Oscura bombing target areas revealed archaeological sites present in low densities (one site per 633 acres). These artifact scatters were not formally assessed for their eligibility for listing on the NRHP, although Kirkpatrick suggests the four prehistoric sites discovered have some degree of research potential. All sites appeared to be relatively small scatters of lithic and, in one case, ceramic, artifacts.

### **3.8.1.5 Mount Dora MOA**

Several sites on the NRHP lie beneath the MOA. Dorsey Mansion (Colfax County, New Mexico) lies roughly 12 miles northeast of Abbott, off U.S. 56. This log and stone building dates from 1878-1879 and was built for U.S. Senator Stephen W. Dorsey. Currently the mansion is in private hands. Wagon Mound (Mora County, New Mexico) is east of the town of Wagon Mound on U.S. 25. This feature was a landmark on the high plains section of the Cimarron Cutoff of the Santa Fe Trail and a guidepost for westward travelers in the 19th century. Wagon Mound is in private hands. Rabbit Ears (Union County, New Mexico) lies northwest of Clayton. This double-peaked mountain, surrounding campsites, and trail remains are known as the Clayton Complex. Rabbit Ears served as the major landmark and guide for travelers along the Cimarron Cutoff of the Santa Fe Trail. The Rabbit Ears area is in multiple public and private ownership. Wagon Mound and Rabbit Ears are designated National Historic Landmarks and are listed on the NRHP.

These places all owe their importance to the Santa Fe Trail, which crosses the MOA. This trail was in heavy use from 1849 through 1879, when the Atchison, Topeka, and Santa Fe Railroad reached Santa Fe. The trail crosses both public and private lands. Trail segments and sites along the Santa Fe National Historic Trail are to be nominated to the NRHP and preserved through cooperative agreements, technical assistance, and state/local efforts.

### **3.8.1.6 Pecos MOA**

Pecos MOA lacks National Historic landmarks. Historically significant sites include the Fort Sumner State Memorial.

## **3.8.2 Native American Values**

### **3.8.2.1 Cannon AFB and Environs**

While New Mexico hosts several reservations and pueblos, no treaty-specified Native American land, water, or other economic resources lie in Curry County. No extensive or significant cultural resources associated with historic groups are documented. Except as otherwise indicated, the discussion following is based on information in HDR Sciences (1981).

Native American groups with historic ties to the Cannon AFB area include the Mescalero Apache, the Jicarilla Apache, and the Comanche. These groups and their ancestors have not occupied the area for more than 100 years (Lintz et al., 1988). The nearest treaty-specified Native American land is the Mescalero Indian reservation. This is located 136 miles southwest of the base. The Jicarilla Apache reservation is located approximately 240 miles northwest of the base and is overflowed by IR-107, one of the MTRs that would be utilized by new F/EF-111s based at Cannon AFB. The Comanche reservation is located in Oklahoma.

Sacred sites of the Comanche, Apache, and related peoples are generally associated with rivers, canyons, and draws. The Rio Grande, Arkansas, Canadian, and Pecos Rivers, for example, were considered sacred by the Jicarilla Apache. Rock art sites are found to the north of Cannon AFB, in the Canadian River valley, but none have been located on the base. Graves associated with historic Native American groups are typically found in caves, rock shelters, or under slabs of sandstone. Cannon AFB and its immediate environs are unlikely locations for either graves or rock art because the physical features usually associated with burials and rock art are not present. The mobile Apache and Comanche cultures considered established trails and, more specifically, ceremonial rock cairns or shines, as sacred areas. Detection and preservation of these features is complicated because of long disuse and extensive Euro-American disturbance of trails and associated markers. Also, the substantial temporal and spatial separation of surviving Native American groups from Curry County may have dissipated tribal knowledge of sacred sites and features.

The land occupied by Cannon AFB neither resembles the areas most likely to contain significant cultural resources nor have significant cultural resources been discovered during survey (Trierweiler, 1988). Cannon AFB is located in a large, relatively flat area well away from streams. In addition, much of Cannon AFB has already been disturbed by construction and base operations. The area around Cannon AFB is unlikely to contain any extensive or significant sites of the historic Native American period.

### 3.8.2.2 Affected MTRs

Native American lands potentially affected by proposed changes in MTR use include the Hopi and Navajo reservations in northeastern Arizona, both of which are partially crossed by IR-112. Although different in history and cultural beliefs, both groups have traditional ties to northern Arizona and parts of New Mexico, both groups have strong religious ties to the land, and traditional religious beliefs continue to provide an important basis for their respective cultures.

Archaeological remains dated to ca. 500 A.D. reveal a clear, uninterrupted cultural relationship with the Hopi and other modern Puebloan groups. Although the Hopi today are integrated into the American economy, Clemmer emphasizes that "fundamental behavior patterns and perceptual modes persist from aboriginal times" (1979:533). A continued reverence for land has been and is currently the mainstay of Hopi culture. Tribal elders refer to Hopi land as a "shrine" that extends far beyond the Hopi villages to the Grand Canyon, the San Franciscan Peaks, the northern reaches of Black Mesa, Zuni Salt Lake, and south of Route 66 (Clemmer, 1968-1970). Religious beliefs and practice permeate every aspect of daily life among the Hopi and the other Pueblo groups (Singley et al., 1979). As always, most Pueblo people belong to a religious society.

The earth is viewed as the mother of all Pueblos and many natural features are imbued with important religious meanings. Water in such an arid environment is

considered particularly important, and lakes, streams, springs, and other bodies of water are highly revered. High peaks are not entered except for strictly religious purposes because these are the places where clouds gather and rain forms. The sky is a primary and sacred focus of Puebloan life and certain Pueblo religious groups or leaders watch the sky for signs of seasonal change, particularly at sacred times such as the solstices and equinox (Singley et al., 1979).

The Navajo are descendants of Apachean peoples from Canada that probably entered the Southwest in the early sixteenth century (Doleman, 1988). When they left Canada, probably due to famine, they were hunters, gatherers, and fishers (Brugge, 1983: 489). Today they are the largest and most financially secure tribe in the United States. Despite their success in the modern economic world, Wyman (1983: 536) indicates "they have been able to preserve practically intact their traditional cultural... beliefs and practices," and most Navajos adhere to their religious/ceremonial beliefs. These beliefs center around the notion that the universe is an orderly, unified system of interrelated elements. All things, ranging from the smallest rock and insect to the largest mountain, have their own significant place in the universe. Maintaining harmony with the world is central to Navajo ceremonial beliefs. Evil and danger come from the disturbance of the natural order of things. The most common result of such disorder is believed to be illness and death. Navajo ceremonialism thus focuses on curing patients affected by the disruption of the natural order of the universe (Wayman, 1983: 536).

The Jicarilla Apache reservation is crossed by IR-109, an MTR that will see slight increase from the proposed action. Section 3.8.2.1 provides baseline data on this Native American group.

### 3.8.2.3 Ranges and MOAs

Data presented in 3.8.2.1 apply to Melrose, Red Rio, and Oscura Ranges, and the Pecos MOA.

### 3.8.2.4 Mount Dora MOA

The Native Americans traditionally associated with the region under the Mount Dora MOA are the Jicarilla Apache and the Comanche. Neither group now lives in the project area. Both were effectively removed from the area by the late 19th century. Since they no longer live in the area, there has been a gradual decline in knowledge of and interest in the region (HDR, 1981).

Features often considered sacred by Native Americans include habitation sites, rock art sites, burial sites, battlegrounds, special caves, ceremonial locations, and physiographic features of significance to traditional beliefs.

Some Native Americans consider all prehistoric sites to have religious significance, but archaeological sites known to have been occupied by historic Native Americans often have particular importance. Sites have been identified in

the MOA area, but their tribal affiliation is uncertain. They could have been occupied by Jacarilla Apache, Comanche, or other groups that occasionally traveled through the region. Rock art sites are often considered sacred and, where they exist, often play an important role in modern Native American religion. Eleven rock sites have been identified in the Texas Panhandle (HDR, 1981). Numerous rock art sites lie under the MOA area (National Park Service, Southwest Region, letter dated 2 February 1990).

It is likely that a great number of burial sites of historic Native Americans exist in the project area (HDR, 1981) but few burial sites have been reported by professional archaeologists. Amateur archaeologists probably know of some burial sites and it is also possible that vandals have destroyed or damaged burial sites in some locations. Burials would be expected to occur at the heads of draws, in crevices, in caves, or in overhangs.

## CHAPTER 4.0 - ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

### 4.1 THE PROPOSED ACTION

#### 4.1.1 Land Use

##### 4.1.1.1 Land Use-Cannon AFB

Land use in the immediate vicinity of the the base is strongly conditioned by existing noise levels associated with current operations. Under the proposed action, noise levels in the near base environment would increase. The area delimited by the Ldn 65 dB contour, for example, would increase by approximately 18%. Currently experienced land use impacts would increase slightly as a result of the proposed action. North of the base along Highway 84/60 are off-base military housing, several houses and mobile homes, and a few commercial businesses. The land around the rest of the base is primarily irrigated farmland which would not be adversely affected by this action.

Land use in several areas north of the base is conditioned by existing base operations. The effects of these operations would increase slightly under the proposed action. Over 12 miles of Highway 64/80 are experiencing levels of Ldn 65 dB or greater. Seven of those 12 miles are experiencing noise levels of Ldn 75 dB or greater. The off-base military housing, private homes, and at least one commercial business are in the existing Ldn 75 dB or greater area. According to the Federal Interagency Committee on Urban Noise report, Guidelines for Considering Noise in Land Use Planning and Control (1980), all types of residential units are not considered appropriate for location in areas that experience noise levels of Ldn 75 dB or greater. Most residential units are permitted in areas that experience noise levels of Ldn 65 dB to 75 dB if certain noise level reduction measures are incorporated into the design and construction of the structures. Mobile homes are not recommended for the Ldn 65 to 75 dB range. Most commercial businesses are considered appropriate in areas that experience noise levels of Ldn 80 dB or less. Livestock farming and animal breeding are not recommended in areas that experience Ldn 75 dB or greater noise levels.

Several residents who live in the area along Highway 64/80 have complained of noise disturbances, damage to homes, decreasing property values, and loss in productivity of livestock. Several residents are requesting that the Air Force purchase their property at a fair market value. Most area residents moved into the area after the establishment of Cannon AFB in the 1950s. These complaints would be expected to continue with the proposed action.

Currently, no land use control mechanisms are in place to limit the potential growth along Highway 64/80. An AICUZ recommending appropriate land uses for areas around the base is under development. An AICUZ is a guidance document to assist other planning efforts around bases. Curry County does not

have zoning ordinances, and previous efforts to implement such ordinances have met opposition. A comprehensive plan is in the draft stages for Curry County. The town of Clovis has the potential to extend its enforcement of zoning five miles from the town's border, which would include the area around Cannon AFB. The city government of Clovis has chosen not to extend its zoning powers into this area at this time.

Other areas directly around Cannon AFB are used primarily for irrigated farmland. Such land use is considered appropriate in areas where noise levels exceed Ldn 85 dB, with some limitations on residential buildings. If any livestock operations occur in this area, they should be located in areas that experience noise levels of Ldn 75 dB or less.

Other areas in Curry County that are not located directly around the base would receive minimal impacts due to noise. Dairies are a growing industry in Curry and Roosevelt Counties, and any new dairy operations should be encouraged to avoid areas that experience direct aircraft overflights.

The town of Clovis would not experience any adverse land use impacts from the proposed action. The town has several platted subdivisions that can still be developed and is excited to receive 801 Housing projects. Most of the new developments can occur in the northern part of the town.

The town of Portales would not experience any adverse land use impacts from the proposed action. Like Clovis, the town has several platted subdivisions that can be developed and has an approved 801 Housing development.

#### 4.1.1.2 Land Use - MTRs

The noise levels along all the MTRs associated with the proposed action would not be expected to exceed Ldnmr 65 dB. All land uses, including residential, are considered appropriate in areas of Ldnmr 65 dB or less (Guidelines for Considering Noise in Land Use Planning and Control, 1980). Most of the MTRs are already experiencing noise disturbances and the proposed action would slightly increase annoyances. Around sensitive areas, such as recreation areas, lateral avoidance or an AGL clearance is raised to reduce impacts.

Two MTRs would experience a marked increase in sorties and noise disturbances. The noise level along IR-110 is expected to rise from Ldnmr 49 dB to 57 dB and the noise level along IR-112 is expected to rise from Ldnmr 48 dB to 55 dB. In addition, the increase in sorties would rise from under 200 in each to over 750 for IR-110 and 411 for IR-112. Portions of IR-112 are directly over the Navajo Reservation. Even though the Ldnmr dB level is under 65, the residents in the area may notice the increase in noise.

#### 4.1.1.3 Land Use - Melrose Range

Increasing sorties into the Melrose Range may create noise annoyances for persons engaged in agricultural activities. Except for a small area in the

northwest portion used for cropland, the leased area of the range is primarily used for cattle grazing. USAF would like to convert all cropland to pasture over the next 5-10 years. Agricultural activities are considered appropriate in areas with noise levels up to  $L_{dn}$  80 dB, although a very small portion of the range exceeds  $L_{dn}$  80 dB. Increasing sorties into the range is not expected to significantly affect agricultural activities in the area.

#### 4.1.1.4 Land Use - Red Rio Range

Despite being exposed to over  $L_{dn}$  70 dB, the Red Rio Range would not experience land use impacts because the area is fenced off and closed to the public.

#### 4.1.1.5 Land Use - Oscura Range

Despite being exposed to over  $L_{dn}$  70 dB, the Oscura Range would not experience land use impacts because the area is fenced off and closed to the public.

#### 4.1.1.6 Land Use - Mount Dora MOA

Because the proposed MOA would prohibit military flight operations below the 1,500 feet AGL floor, impacts to land use would be primarily related to noise. The noise level is not expected to exceed  $L_{dn}$  65 dB.

Portions of the proposed MOA contain MTRs and are already exposed to aircraft noise. While the overall noise level for Mount Dora would not exceed  $L_{dn}$  65 dB, it may be possible that if operations become concentrated, these noise levels may produce complaints.

There is some concern that flight activity may frighten cattle, sheep, horses, and other domestic livestock. Agricultural activities are considered appropriate in areas with noise levels up to  $L_{dn}$  80 dB (Guidelines for Considering Noise in Land Use Planning and Control, 1980). However, since noise exposures ( $L_{dn}$ ) in the area beneath the MOA are not expected to exceed  $L_{dn}$  65 dB, no adverse impact to agricultural land use would be expected.

Although the proposed MOA overlies several public recreation areas (one national grassland, one national monument, and two state parks), the proposed action would not result in significant impacts to land uses in these areas. Several MTRs fly near the recreation areas but either a lateral avoidance or the AGL clearance is raised to reduce impacts. An increase of sorties that use the existing MTRs and the creation of the MOA would add to the existing noise annoyances at the recreation areas.

While the proposed action would increase noise disturbances under the proposed MOA, it is doubtful that the MOA would present significant impacts or conflicts in land ownership or land-use patterns.

#### 4.1.1.7 Land Use - Pecos MOA

Noise levels in the Pecos MOA would not be expected to exceed Ldn 65 dB; therefore, minimal noise impacts are expected in this MOA. Most of the area is used for cattle grazing, and this activity is considered appropriate in areas subject to the estimated noise levels.

#### 4.1.2 Air Quality

##### 4.1.2.1 Cannon AFB

This section addresses the impacts of the proposed action on air quality at Cannon AFB. The changes in air quality that would occur as a function of changes in mission at the base are presented and compared to applicable air quality standards. The expected impacts to air quality resulting from the action would be insignificant. Air quality in the vicinity of Cannon AFB is expected to remain in attainment with all applicable state and national standards.

As discussed in Section 3.2 of this document, the current 1991 baseline air emissions for Cannon AFB are higher than the original baseline developed as part of the Realignment EIS (TAC, 1990). The higher emissions baseline is due to a higher level of activities associated with an increased number of planes and personnel assigned to Cannon AFB. The estimated emissions increases in the baseline would be 36 to 42 percent, depending on the pollutant. These emission increases would be approximately one-half of the increases expected from the proposed action presented in the Realignment EIS. Since no significant air quality impacts were found with the proposed action in the Realignment EIS, it can be concluded that no air quality impacts would be expected from the higher emissions in the current 1991 baseline.

There are also two baseline air emissions scenarios connected with this EIS: the "current" 1991 baseline and the "projected" 1992 baseline. However, the air emissions from Cannon AFB would be the same for both scenarios: the number of planes and sorties associated with the base do not change. The differences in the 1991 and 1992 emission baselines occur only at the MOAs and Ranges, where increased activity is projected in 1992 by planes that are not based at Cannon AFB (discussed in section 4.1.2.2). Since the baseline emission scenarios are identical, future references in this section to the baseline will refer to the 1991 baseline for clarity.

The proposed action at Cannon AFB may impact air quality in the vicinity, due primarily to emissions from increases in the following activities:

- aircraft ground operations including engine runups
- heating and power production
- fuel storage, transfers, and spills
- surface coating
- aircraft flying operations
- aerospace ground equipment (AGE)

- diesel fuel combustion
- motor vehicles
- base construction

Emissions from these increased activities are summarized in Table 4.1.2-1. The air emissions inventory for the proposed action was developed by revising the 1991 baseline emissions inventory to reflect the increased activity levels, as follows:

- 1) Increases in emissions from aircraft ground support activities, including routine maintenance, machining, surface coating, refurbishing, AGE testing, and fuel storage/handling, were estimated by using a ratio of the number of incoming F-111s to the current number of F-111s.
- 2) Increases in emissions from aircraft flying operations and AGE were estimated by determining the increase in the number of aircraft sorties.
- 3) Increases in vehicular emissions and heating and power production were estimated by determining the increase in personnel at the base.

This methodology was also used in Section 3.2 to develop the 1991 baseline emissions inventory from the original baseline presented in the Realignment EIS.

Table 4.1.2-1 compares the percent increase in air emissions due to the proposed action to both the 1991 baseline emissions inventory and the earlier baseline emissions inventory presented in the 1990 Realignment EIS. The table shows that the proposed action results in air emission increases of 30-34 percent above the 1991 baseline inventory (depending on the pollutant), and emission increases of 80-85 percent above the baseline inventory in the Realignment EIS. These increases due to this proposed action would be similar in magnitude to the emission increases of 66-78 percent found in the Realignment EIS due to the action proposed in that document.

There would also be emissions from the extensive military construction projects which would be required as part of the proposed action. The principal pollutant generated during the construction phase would be fugitive dust from activities such as water well drilling, soil excavation, loading, and hauling. Fugitive emissions from construction activity would vary depending on many factors, including the timing of the projects, the extent of construction activity, weather conditions, and the effectiveness of emissions controls such as watering. The emissions estimate provided in the Realignment EIS, 72 tons per year, should be a reasonable estimate for this activity in the current proposed action. However, emissions from construction activities are not a critical factor in reviewing the air quality impacts of a project, because fugitive dust produced from construction is considered to be only a temporary activity and is therefore not normally considered in determining whether a proposed action would meet federal and state air quality standards.

**Table 4.1.2-1 Increase in Cannon AFB Air Emissions  
Due to Proposed Action**

<u>STATIONARY SOURCES</u>		<u>POLLUTANT TONS/YEAR</u>				
ACTIVITY		CO	HC (NON-METHANE)	NOX	PART	SOX
Aircraft Ground Operations		7.51	2.39	5.19	0.28	1.21
Heating & Power Production		3.02	0.26	14.7	0.22	0.19
Fuel Storage, Transfers and Spills		-	26.8	-	-	-
Surface Coating		-	6.92	-	-	-
Fire Fighting Training		<u>4.12</u>	<u>2.36</u>	<u>0.03</u>	<u>0.94</u>	<u>0.03</u>
<b>SUB TOTAL</b>		<b>14.7</b>	<b>38.7</b>	<b>19.9</b>	<b>1.44</b>	<b>1.43</b>
<u>NON-STATIONARY SOURCES</u>						
ACTIVITY						
Aircraft Flying Operations		221	77.0	77.0	1.16	10.5
AGE Emissions		21.4	3.24	40.8	2.59	0.59
Diesel Fuel Combustion		6.2	1.00	4.53	0.28	0.61
Motor Vehicles		<u>121</u>	<u>13.1</u>	<u>13.0</u>	<u>1.72</u>	<u>0.52</u>
<b>SUBTOTAL</b>		<b>370</b>	<b>94.3</b>	<b>135</b>	<b>6.08</b>	<b>12.2</b>
<b>TOTAL</b>		<b>385</b>	<b>133</b>	<b>155</b>	<b>7.5</b>	<b>13.6</b>
Percent increase from 1991/1992 baseline Cannon AFB emissions:		30%	33%	32%	31%	34%
Percent increase from baseline emissions in Cannon AFB EIS (1990):		85%	80%	84%	83%	83%

Notes: The data were originally derived from the Environmental Impact Statement for the realignment of Cannon AFB (1990) and modified to reflect increased activity at the Base.

The realignment EIS used a box model to estimate the impact of the total emissions from the proposed action, provided in Table 4.1.2-1. The emissions are assumed to be uniformly mixed in a box whose dimensions are chosen in a conservative (health-protective) manner to represent the volume into which the pollutants are initially mixed. The dimensions of the box were chosen to be 300 meters high, 1,500 meters wide, and 2.5 meters long (representing a wind speed of 2.5 meters/sec which would disperse the pollutants downwind). This same approach was used to determine the impacts from the increase in emissions due to the proposed action. Table 4.1.2-2 presents the estimated air quality impacts using this approach.

Table 4.1.2-2 presents both state and federal ambient air quality standards for comparison to the impacts from the proposed action. EPA replaced the TSP NAAQS with a PM<sub>10</sub> (particulate matter smaller than 10 microns in diameter) in July 1988. The TSP standard is referenced in the table because emission factors developed for TSP were used to calculate the emission inventory for particulates (typically, comparing TSP emissions against the TSP air quality standard will produce conclusions similar to those reached by comparing PM<sub>10</sub> emissions against the PM<sub>10</sub> standard).

The table shows that the maximum air quality impact is predicted to be 3.5 percent of the New Mexico state NO<sub>x</sub> standard, with impacts of all other pollutants expected to be less than 1.0 percent of their respective standards. Because of the conservative methods used in predicting these impacts, and because of the intermittent nature of the base activities, overall air quality impacts would be expected to be less than these predictions.

The Cannon AFB area is in attainment with the NAAQS and the NMAAQS for all criteria pollutants, and this analysis indicates that no violations of any air quality standards are expected from the proposed action at Cannon AFB. Consequently, the nonattainment provisions of the Clean Air Act (specifically Section 176, which requires that no federal facility cause or contribute to any violation of any air quality standards or delay attainment of those standards) do not apply to the proposed action.

Concerns were expressed at the scoping meeting with respect to discharge of unburned fuel from airborne aircraft (a process referred to as "fuel dumping" or "fuel jettisoning") at Cannon AFB. These concerns focused on adverse effects that might arise from unburned fuel which might reach ground level. Clewell (1980) reported the findings of a detailed study of fuel jettisoning in the Air Force. The following analysis of fuel dumping at Cannon AFB for the realignment action is based on the findings in Clewell's report.

Fuel dumping is permitted within the Air Force "only to reduce aircraft gross weight in the case of an emergency". Approximately 85% of jettison events are associated with aircraft emergencies (e.g., engine failure), while 15% are associated with mission aborts (e.g., associated with radio or compass failure). Clewell (1980) found that approximately 1.2% of F-111 sorties from Cannon AFB involved fuel jettisoning. A typical F-111 event involves jettisoning about 4

**Table 4.1.2-2. Ambient Air Quality Impact Due to the Proposed Action (ug/m<sup>3</sup>)**

Pollutant	Averaging Period	Standard		Ambient Concentrations
		State	Federal	
TSP	24 hr Primary	none	260	1.3
	24 hr Secondary	150	150	1.3
SO <sub>2</sub>	24 hr	265	365	0.69
	3 hr	none	1300	1
NO <sub>x</sub>	24 hr	200	none	7*
CO	8 hr	9700	10000	22
	1 hr	15000	40000	31

\* Assumes 100% conversion of NO<sub>x</sub> to NO<sub>2</sub> (worst case).

tons of JP-4 fuel at altitudes above 5000 feet. Modeling studies indicate that in still air at 20° C and 5,000 feet AGL, less than 0.2% of the fuel jettisoned reaches the ground. The bulk of the jettisoned fuel evaporates on the way to the ground. Under these conditions residual fuel concentrations reaching the ground are estimated to be less than 0.02 mg/square meter. It is not likely that such minimal contamination of the ground would be noticeable even on close inspection.

It is possible that repeated fuel jettison events could result in the build up of fuel evaporation residual at a given point on the ground. At Cannon AFB an estimated 134 fuel jettison events occur per year (assuming 1.2% of the sorties per year involve fuel jettisoning). Under the realignment an additional 46 jettisoning events would be expected per year. Most jettison events at Cannon AFB occur within a radius of 30 miles of the base. In keeping with TAC directives, jettisoning would normally occur away from populated areas (i.e., away from Cannon AFB) to the greatest extent possible in keeping with mission safety. It is unlikely that any particular area in the near base environment would be exposed more frequently than others to jettison fuel residual. Given the relatively large area at Cannon AFB within which jettisoning occurs (more than 2800 square miles) it is unlikely that any given area near the base would receive more than a few additional exposures to jettisoned fuel. Given the negligible concentration of jettison fuel residual, no significant increase in ground contamination would be expected from this action.

#### 4.1.2.1.1 Air Quality Permits for Cannon AFB

The New Mexico Air Quality Improvement Board requires that construction and operating permits be obtained for any stationary source of a regulated pollutant if the actual emissions rate exceeds ten pounds per hour or if the potential emissions rate exceeds 100 pounds per hour. Toxic emissions are strictly regulated, and allowable emissions of toxic pollutants are listed individually by compound in Appendix A of the New Mexico Air Regulations. Based on the most recent emissions inventory supplied by the Bioenvironmental Engineering Services Division of Cannon AFB, there are no significant sources of toxic emissions on the base.

Facilities such as new fuel storage tanks, painting and/or coating operations which use volatile paints and coatings, and fossil fuel-fired boiler plants are among those that may require permits, depending on the facility size and emissions level. As shown in Table 4.1.2-1, the surface coating activities at the base associated with the proposed action would result in an increase of 6.92 tons per year. This corresponds to an average emissions rate of approximately 7 pounds per hour (based on 2,000 hours per year operation), which is just below the ten pounds per hour requirement for an operating permit. The table also shows that there would be an estimated emission of non-methane hydrocarbons of 26.8 tons per year due to fuel storage, transfer, and spills. This corresponds to an average emission rate of approximately 6 pounds per hour (based on 8,760 hours of operation). Modifications to existing permitting may be required.

Neither the New Mexico Air Quality Improvement Board nor the EPA have established regulations which require that air quality permits be obtained for military aircraft operations. Emissions from military aircraft may be tracked via a regional or state emissions inventory, but permits are not necessary at this time.

#### 4.1.2.2 Aircraft Ranges, MOAs, and MTRs

An analysis was conducted to determine the air quality impacts due to increased operational activities related to the number of sorties for the proposed action, as provided in Section 2 of this document. The incremental increase in emissions within a Range, MOA, or MTR would be due to an increase in sorties by several different military aircraft operating within that area.

Table 4.1.2-3 provides the emission factors for the four types of military aircraft that would be increasing their activity due to the proposed action: F-111, EF-111, F-117, and AT-38. The emission factors were based on the Aircraft Engine Emissions Estimator document (Seitchek, 1985). The use of these areas by all other types of aircraft would not change between the current baseline activity and the proposed action.

The number of sorties conducted within each airspace by each type of aircraft is based on information presented in Section 2 of this document.

As discussed in the previous section on Cannon AFB, there are two baseline scenarios: the "current" 1991 baseline and a "projected" 1992 baseline. The difference in these baselines is due to an increased number of sorties in 1992 within ranges and MOAs by military aircraft not based at Cannon AFB. Consequently, the 1992 baseline is higher than the 1991 baseline for Melrose, Red Rio and Oscura Ranges, and for the Mount Dora MOA. The 1991 and 1992 baseline emissions at the Pecos MOA and for all MTR airspaces are identical because the anticipated number of sorties is unchanged between the two periods.

**Table 4.1.2-3 Emission Factors for Military Aircraft**

<b>Emissions at "Military" Power Setting (lb/hr)</b>					
<b>Aircraft</b>	<b>CO</b>	<b>HC</b>	<b>NOx</b>	<b>PM</b>	<b>SOx</b>
F-111	12.71	1.82	508.48	4.36	18.20
EF-111	13.84	1.73	346.00	6.06	18.20
F-117	40.80	3.30	407.50	5.50	16.30
AT-38	152.54	4.21	13.68	0.09	5.25

Table 4.1.2-4 presents the increased emissions contribution from each aircraft within each airspace, calculated from the 1991 baseline. Table 4.1.2-5 summarizes the data presented in Table 4.1.2-4. Table 4.1.2-6 presents the increased emissions contribution from each aircraft within each airspace, calculated from the 1992 baseline. Table 4.1.2-7 summarizes the data presented in Table 4.1.2-6.

The tables show that the emission increases due to the proposed action would be highest at the MOAs and Ranges, since the use of these airspaces is higher by the aircraft. The maximum increases in emissions, under worst-case conditions for each pollutant (using the lower 1991 baseline emissions) are approximately:

- 46 tons/yr of SO<sub>2</sub> (Mt. Dora MOA)
- 1184 tons/yr of NO<sub>x</sub> (Mt. Dora MOA)
- 12.3 tons/yr of particulate matter (Red Rio Range)
- 8.4 tons/yr of hydrocarbons (Red Rio Range)
- 138 tons/yr of CO (Red Rio Range)

The airspace which has maximum emissions does not coincide for each pollutant because there is a different mix of aircraft using each airspace, which have differing emission rates of each pollutant. These emissions would be spread over a large volume of airspace and would occur only intermittently during aircraft operations. Consequently, the impact of these emissions on ambient air quality is expected to be insignificant. Support for this conclusion is provided below by an air quality modeling analysis, which was conducted to determine the potential impacts of emissions within an MTR on a sensitive PSD Class I area.

#### 4.1.2.2.1 Air Quality Impacts on PSD Class I Areas

Section 3.2 of this document noted that three of the MTRs in the proposed action pass over mandatory PSD Class I areas: IR-109, San Pedros Parks Wilderness Area; IR-111, Pecos Wilderness Area; and IR-112, Petrified Forest National Park. Table 4.1.2-5 shows that IR-111 has the largest increase in emissions of the three MTRs from the proposed action, because it has the highest increase in sorties (338). Since the 1991 and 1992 baseline emission rates are identical at each MTR (the same number of aircraft sorties are expected), the estimated emission increase due to the proposed action is also identical for both baseline cases. The analysis will focus on IR-111 in order to determine the worst case air quality impacts from the proposed action.

Emissions within IR-111 are estimated to increase by 2.31 tons/yr of SO<sub>2</sub>, 43.2 tons/yr of NO<sub>x</sub>, 0.78 tons/yr of particulate matter, 0.22 tons/yr of hydrocarbons, and 1.77 tons/yr of CO. Since the emissions in IR-111 must be compared against the very restrictive PSD Class I increments, this analysis provides a sensitive measure of the air quality impacts on the airspace from the proposed action.

**Table 4.1.2-4**  
**Increased Emissions from 1991 Baseline**  
**Due to Proposed Action**

Unit	Aircraft Type	Increase in Sorties	Change in Emisssions (tons/yr)				
			CO	HC	NOx	PM	SOx
Melrose Range	F-111	3410	3.6	0.5	144.5	1.2	5.2
	EF-111	900	1.0	0.1	26.0	0.5	1.4
	F-117	1440	4.9	0.4	48.9	0.7	2.0
Red Rio Range	F-111	2294	2.4	0.3	97.2	0.8	3.5
	EF-111	240	0.3	0.0	6.9	0.1	0.4
	F-117	4782	16.3	1.3	162.4	2.2	6.5
	AT-38	1230	15.6	0.4	1.4	0.0	0.5
Oscura Range	F-111	572	0.6	0.1	24.2	0.2	0.9
	EF-111	60	0.1	0.0	1.7	0.0	0.1
	F-117	3712	12.6	1.0	126.1	1.7	5.0
	AT-38	896	11.4	0.3	1.0	0.0	0.4
Mt.Dora MOA	F-111	5760	6.1	0.9	244.1	2.1	8.7
	EF-111	1800	8.3	1.0	207.6	3.6	10.9
Pecos MOA	F-111	4434	4.7	0.7	187.9	1.6	6.7
	EF-111	1800	8.3	1.0	207.6	3.6	10.9
MTR IR-107	F-111	-166	-0.2	-0.0	-7.0	-0.1	-0.3
	EF-111	612	2.8	0.4	70.6	1.2	3.7
MTR IR-109	F-111	-172	-0.2	-0.0	-7.3	-0.1	-0.3
	EF-111	360	1.7	0.2	41.5	0.7	2.2
MTR IR-110	F-111	404	0.4	0.1	17.1	0.1	0.6
	EF-111	180	0.8	0.1	20.8	0.4	1.1
MTR IR-111	F-111	-58	-0.1	-0.0	-2.5	-0.0	-0.1
	EF-111	396	1.8	0.2	45.7	0.8	2.4
MTR IR-112	F-111	150	0.2	0.0	6.4	0.1	0.2
	EF-111	100	0.5	0.1	11.5	0.2	0.6
MTR IR-113	F-111	-385	-0.4	-0.1	-16.3	-0.1	-0.6
	EF-111	396	1.8	0.2	45.7	0.8	2.4
MTR VR-100	F-111	575	0.6	0.1	24.4	0.2	0.9
	EF-111	288	1.3	0.2	33.2	0.6	1.7
MTR VR-108	F-111	127	0.1	0.0	5.4	0.0	0.2
	EF-111	180	0.8	0.1	20.8	0.4	1.1
MTR VR-114	F-111	537	0.6	0.1	22.8	0.2	0.8
	EF-111	684	3.2	0.4	78.9	1.4	4.1
MTR VR-125	F-111	114	0.1	0.0	4.8	0.0	0.2
	EF-111	144	0.7	0.1	16.6	0.3	0.9

**Table 4.1.2-5**

**Summary of Increased Emissions from 1991 Baseline  
Due to the Proposed Action**

Unit	Increase in Sorties	Change in Emissons (tons/yr)				
		CO	HC	NOx	PM	SOx
Melrose Range	5750	9.55	1.04	219.3	2.35	8.49
Red Rio Range	8546	34.60	2.13	267.9	3.16	10.88
Oscura Range	5240	24.69	1.43	153.0	1.95	6.39
Mt. Dora MOA	7560	14.40	1.91	451.7	5.73	19.66
Pecos MOA	6234	13.00	1.71	395.5	5.25	17.64
MTR IR-107	446	2.65	0.33	63.6	1.18	3.46
MTR IR-109	188	1.48	0.18	34.2	0.66	1.92
MTR IR-110	584	1.26	0.17	37.9	0.51	1.70
MTR IR-111	338	1.77	0.22	43.2	0.78	2.31
MTR IR-112	250	0.62	0.08	17.9	0.26	0.83
MTR IR-113	11	1.42	0.17	29.4	0.66	1.82
MTR VR-100	863	1.94	0.25	57.6	0.79	2.62
MTR VR-108	307	0.96	0.12	26.1	0.41	1.28
MTR VR-114	1221	3.72	0.48	101.6	1.58	4.96
MTR VR-125	258	0.79	0.10	21.4	0.33	1.05

Table 4.1.2-6

**Increased Emissions from 1992 Baseline  
Due to Proposed Action**

Unit	Aircraft Type	Increase in Sorties	Change in Emissons (tons/yr)				
			CO	HC	NOx	PM	SOx
Melrose Range	F-111	3410	3.6	0.5	144.5	1.2	5.2
	EF-111	900	1.0	0.1	26.0	0.5	1.4
	F-117	0	0.0	0.0	0.0	0.0	0.0
Red Rio Range	F-111	2294	2.4	0.3	97.2	0.8	3.5
	EF-111	240	0.3	0.0	6.9	0.1	0.4
	F-117	0	0.0	0.0	0.0	0.0	0.0
	AT-38	0	0.0	0.0	0.0	0.0	0.0
Oscura Range	F-111	572	0.6	0.1	24.2	0.2	0.9
	EF-111	60	0.1	0.0	1.7	0.0	0.1
	F-117	0	0.0	0.0	0.0	0.0	0.0
	AT-38	0	0.0	0.0	0.0	0.0	0.0
Mt.Dora MOA	F-111	4968	5.3	0.8	210.5	1.8	7.5
	EF-111	1800	8.3	1.0	207.6	3.6	10.9
Pecos MOA	F-111	4434	4.7	0.7	187.9	1.6	6.7
	EF-111	1800	8.3	1.0	207.6	3.6	10.9
MTR IR-107	F-111	-166	-0.2	-0.0	-7.0	-0.1	-0.3
	EF-111	612	2.8	0.4	70.6	1.2	3.7
MTR IR-109	F-111	-172	-0.2	-0.0	-7.3	-0.1	-0.3
	EF-111	360	1.7	0.2	41.5	0.7	2.2
MTR IR-110	F-111	404	0.4	0.1	17.1	0.1	0.6
	EF-111	180	0.8	0.1	20.8	0.4	1.1
MTR IR-111	F-111	-58	-0.1	-0.0	-2.5	-0.0	-0.1
	EF-111	396	1.8	0.2	45.7	0.8	2.4
MTR IR-112	F-111	150	0.2	0.0	6.4	0.1	0.2
	EF-111	100	0.5	0.1	11.5	0.2	0.6
MTR IR-113	F-111	-385	-0.4	-0.1	-16.3	-0.1	-0.6
	EF-111	396	1.8	0.2	45.7	0.8	2.4
MTR VR-100	F-111	575	0.6	0.1	24.4	0.2	0.9
	EF-111	288	1.3	0.2	33.2	0.6	1.7
MTR VR-108	F-111	127	0.1	0.0	5.4	0.0	0.2
	EF-111	180	0.8	0.1	20.8	0.4	1.1
MTR VR-114	F-111	537	0.6	0.1	22.8	0.2	0.8
	EF-111	684	3.2	0.4	78.9	1.4	4.1
MTR VR-125	F-111	114	0.1	0.0	4.8	0.0	0.2
	EF-111	144	0.7	0.1	16.6	0.3	0.9

**Table 4.1.2-7**

**Summary of Increased Emissions from 1992 Baseline  
Due to the Proposed Action**

Unit	Increase in Sorties	Change in Emissions (tons/yr)				
		CO	HC	NOx	PM	SOx
Melrose Range	4310	4.65	0.65	170.4	1.69	6.54
Red Rio Range	2534	2.71	0.38	104.1	0.95	3.84
Oscura Range	632	0.68	0.10	26.0	0.24	0.96
Mt. Dora MOA	6768	13.57	1.79	418.1	5.44	18.45
Pecos MOA	6234	13.00	1.71	395.5	5.25	17.64
MTR IR-107	446	2.65	0.33	63.6	1.18	3.46
MTR IR-109	188	1.48	0.18	34.2	0.66	1.92
MTR IR-110	584	1.26	0.17	37.9	0.51	1.70
MTR IR-111	338	1.77	0.22	43.2	0.78	2.31
MTR IR-112	250	0.62	0.08	17.9	0.26	0.83
MTR IR-113	11	1.42	0.17	29.4	0.66	1.82
MTR VR-100	863	1.94	0.25	57.6	0.79	2.62
MTR VR-108	307	0.96	0.12	26.1	0.41	1.28
MTR VR-114	1221	3.72	0.48	101.6	1.58	4.96
MTR VR-125	258	0.79	0.10	21.4	0.33	1.05

The Multiple-Aircraft Instantaneous Line Source (MAILS) Dispersion Model (Liebsch, 1990) was used to estimate air pollution concentrations from the proposed increase in sorties for IR-111, and to compare these concentrations with the PSD Class I increments. The MAILS model is an air quality screening model that provides conservative estimates of ground level pollutant concentrations resulting from aircraft engine emissions along MTRs and is intended for low altitude flights (below 3,000 ft).

The model input was based on the engine emission factors and aircraft use data presented earlier. The model was run in a conservative manner in order to determine the worst-case impacts. For example, USAF estimates that approximately 41 percent of the aircraft fly in the MTRs at 500 feet AGL; the model was run assuming that 100 percent of the aircraft fly at 500 feet AGL, thereby maximizing the air quality impacts at ground level.

Table 4.1.2-8 provides the results of this modeling analysis and compares them with the PSD Class I increment. Printouts of the model runs are included in Appendix B. The modeling results showed that the highest Class I increment consumption in the Petrified Forest National Park from increased activity in IR-111 due to the proposed action is expected to be 0.13 percent of the annual NO<sub>2</sub> Class I increment. This is an insignificant air quality impact.

#### 4.1.3 Noise

This section describes the noise environment likely to result from the proposed action. The noise levels reported in this section would be the result of a combined increase of 2 F-111s and 25 EF-111s at Cannon AFB. The analysis procedure used to obtain the proposed action noise levels followed the same procedure used for the baseline noise levels in Section 3.3.

##### 4.1.3.1 Cannon AFB Proposed Action Operations

This section addresses the impacts to baseline noise levels due to the increased subsonic flights activity at the base that would be expected to occur if the action is adopted. The increase in aircraft is evaluated in terms of timing, duration, and overall noise.

The action would cause an increase in long-term noise exposures around Cannon AFB, due primarily to the additional flight and engine-test operations of the relocated aircraft. Other short-term and long-term noise impacts would be caused by the construction of new facilities on the base and the inevitable increase in road traffic due to additional personnel at the base. These latter noise impacts would not be significant in residential community areas relative to noise impacts caused by aircraft operations. The additional noise impact due to proposed action aircraft operations has been analyzed by incorporating the aircraft movement data for the relocated aircraft into the NOISEMAP data base

**TABLE 4.1.2-8 Results of MAIIS Modeling Runs for Proposed Action  
Using IR-111**

Criteria Pollutant	Averaging Period	Concentration (ug/m3)			Impact of Proposed Action as a Percentage of the PSD Class I Increment
		NAAQS	PSD Increment Class I	Proposed Action	
NO2	Annual	100	2.5	0.0033	0.13
PART (a)	24-hour	150	10(b)	8(b,c)	0.0004
	Annual	50(b)	5	4(c)	0.0001
SO2	3-hour	1300(b)	25(b)	0.0126	0.051
	24-hour	365(b)	5(b)	0.0012	0.024
	Annual	80	2	0.0002	0.009

a-Particulate Matter under 10 microns (PM-10)

b-Not to be exceeded more than once per year

c-These listed PM-10 Class I increments were recently proposed, pending final rule promulgation

d-The MAIIS model uses the recently proposed PM-10 increments for PSD Class I areas to calculate the impact of proposed MTRs

used to evaluate existing noise conditions. The additional aircraft operations have been distributed, for analysis purposes, among all of the existing flight tracks at Cannon AFB in a manner identical to that used for the current F-111 aircraft at the base. The resulting noise contours for the combined noise environment of the existing and future aircraft activity are shown in Figure 4.1.3-1.

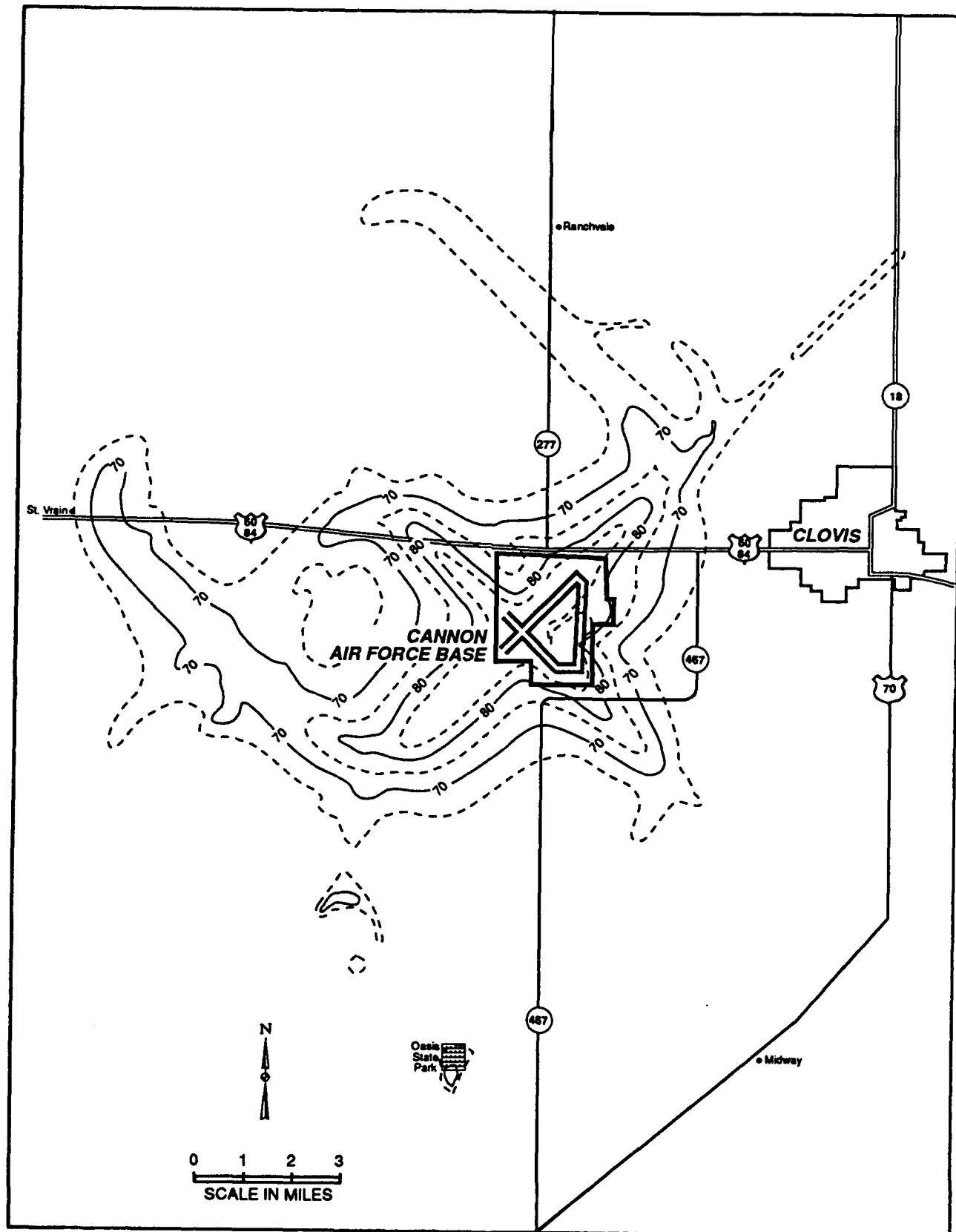
Changes in the residences encompassed by the noise contours, between the 1991 baseline and conditions under the proposed action, are presented in Table 4.1.3-1. As a result of this action, an additional 7 individuals would reside within the 65 dB contour.

#### 4.1.3.2 Affected MTRs

Table 4.1.3-2 shows the percentage increase in the number of operations for each of the routes and estimates of the noise levels along the route centerline. IR-110 has the greatest increase in noise level due to the proposed action. Currently, there are 172 annual daytime operations on IR-110. These operations are expected to increase to 756 operations per year, of which 60 would be flown after 10:00 p.m., resulting in an  $L_{dnmr}$  9 dB increase. Even though the resulting level is below  $L_{dnmr}$  65 dB, the increase in the number of operations and that some of these operations will be flown at night may cause annoyance.

The noise levels produced from route crossings and routes that overlapped were also analyzed. The overlap of VR-100 B-F with VR-125 L-P has a level of  $L_{dnmr}$  64 dB. The overlap of IR-111 H-J, IR-109 H-J, and Mount Dora MOA was found to produce a combined level of  $L_{dnmr}$  64 dB. Other route crossings and multiple routes were identified, none of these producing levels at or above  $L_{dnmr}$  65 dB.

An  $L_{dnmr}$  of 65 dB is considered to be the level at which significant community reaction to noise would occur in residential areas. None of the levels exceed this threshold. However, the significant increase in the number of operations along several of these routes and the use of these routes between the hours of 10:00 p.m. and 7:00 a.m. may result in annoyance among residents living below the routes.



**Figure 4.1.3-1. Ldn Noise Contours (dB) for Aircraft Activity Under the Proposed Action**

**Table 4.1.3-1. Land Use within Ldn Noise Contours  
Cannon AFB under the Proposed Action**

	Current Conditions				Proposed Action			
<b>Day Night Average Sound Level Contour Lower Bound (dB)</b>	80	75	70	65	80	75	70	65
<b>No. of Dwellings Outside of Base</b>	7	21	114	151	9	25	120	158
<b>No. of Residents* Outside of Base</b>	19	56	302	400	24	66	318	418

\* Based on the number of dwellings multiplied by persons per household for Curry County

**Table 4.1.3-2. Proposed Action MTR Noise Levels, Ldnmr**

Military Training Route Segments	Noise Levels, Ldnmr		
	Baseline 1991 and 1992	Proposed Action	Increase In Noise Level
IR-107*	59	62	3
IR-109			
A-E	57	60	3
E-AO	60	63	3
AO to end of Route	57	60	3
IR-110	48	57	9
EA-XJ			
IR-111	57	60	3
A-S			
IR-112	48	55	7
A-N			
IR-113	58	60	2
A-R			
VR-100			
A-B	51	59	8
B-F	54	62	8
F-Q	51	59	8
VR-108	52	57	5
A-F			
VR-114	58	63	5
A-G			
VR-125			
A-L	51	56	5
L-P	54	59	5
P-Q	51	56	5

#### 4.1.3.3 MOAs and Ranges

The noise impact below the MOAs and Ranges for the proposed action is shown in Table 4.1.3-3. The noise analysis assumes the distribution of aircraft over the MOAs and Ranges is uniform. The probability of overflight is equal throughout the entire area occupied by the MOA or Range. If this random distribution of aircraft were to become concentrated, for example, in one segment of the MOA on any specific day, the expected noise exposure could increase by as much as Ldn 5 dB. However, this would require the operations in one given area to increase by a factor of three above the original estimates. In other portions of the MOA the noise level would noticeably decrease.

Noise levels below the Pecos MOA are the highest levels reported under populated areas. It is estimated that the noise levels will increase by Ldn 7 dB. The number of flyovers having an SEL exceeding 80 dB below the Pecos Low MOA are expected to increase from 3 events to 13 events per month. This means that a listener beneath the Pecos MOA will hear four times as many loud events as a result of this action.

When an MTR crosses a MOA or Range, the noise from each is added. Segments of IR-107, VR-108, IR-109, IR-111, IR-150, and IR-177 overlap the Mount Dora MOA. In the Pecos MOA, IR-113 overlaps the MOA twice. VR-1107/1195 also overlaps Pecos MOA but is not considered here because it was not part of the proposed action. In all cases the noise levels in the MOAs would not be expected to exceed Ldn 65 dB. It is possible that if the operations become unusually concentrated, the levels may reach Ldn 65 dB. In the event that these levels did produce complaints, operations could be revised to mitigate any impact.

The Red Rio and Oscura Ranges are within the fenced, restricted area of the WSMR and are not populated. No adverse noise related impact would be expected in these areas.

#### 4.1.3.4 Melrose Range

The methodology and assumptions used to model the flight operations and noise exposures for the Melrose Range are described in detail in Section 3.3. In estimating the resulting noise exposure for the proposed action, the number of sorties that would be flown by the F-111s and EF-111s are anticipated to increase from 5,230 to 8,640 sorties per year for the F-111s and increase from no current operations to 900 operations for the EF-111s. Increasing the sorties per year would increase the number of sorties over the range by 34 percent when compared to the 1992 baseline condition. In other portions of the MOA the noise level would noticeably decrease.

Table 4.1.3-4 shows the track usage expected from the proposed action. Tracks 4N and 5N have the highest usage. The resulting combination of baseline and proposed action would produce noise contours as shown in

**Table 4.1.3-3 Proposed Action MOA and Range Noise Levels**

		1991 Baseline (Ldn)	1992 Baseline (Ldn)	Proposed Action (Ldn)
MOAs	Pecos Low	53	53	60
	Pecos High	36	36	43
	Mt. Dora	46	49	59
Ranges	Red Rio	61	70	72
	Oscura	65	71	71

**Table 4.1.3-4 Track Usage at Melrose Range by Specific Aircraft Passes Per Day\***

**Proposed Action**

Aircraft	1D	2D	1N	2N	3N	4N	5N	6N	Total
F-111						73.4/6.4	73.4/6.4		146.8/12.8
EF-111						6.6/1.65	6.6/1.65		13.3/3.3
F-117	9.9	3.3	1.1/4.2	0.6/2.1	0.3/1.1	0.6/2.1	0.3/1.1		16.0/10.6
A-7	15.3	5.1	1.7	0.9	0.4	0.9	0.5		24.8
A-6									
F-18	0.5	0.2	0.2	0.1	0.1	0.1	0.1		1.2
B-1B								0.3	0.3
B-52G						0.1	0.1		0.2
Other	0.4	0.1							0.5
TOTAL PASSES PER DAY									203.1/26.7

\* Single values represent daytime only; dual values are day/night.

Figure 4.1.3-2. It can be seen here that the contours follow the 4N and 5N tracks, as before, and that their width has increased by approximately a quarter of a mile.

Table 4.1.3-5 shows estimates of the land areas exposed to contours of Ldn 65 dB and greater. The increase in land area enclosed by the Ldn 65 dB contour was found to represent 36 percent more than the area enclosed by the Ldn 65 dB contour for Baseline 1992.

Within the enclosed Ldn 65 dB contour, the number of residents who are expected to be impacted is 114 as compared to 83 residents living within the Baseline 1992 contours. The number of persons who would be expected to be highly annoyed due to aircraft noise from the Range operations would increase from 18 residents to 27 residents. These estimates are based on the relationship between Ldn levels and the percentage of people expected to be highly annoyed. (See Figure 3.3-3 in section 3.3.2)

#### 4.1.4 Airspace Management

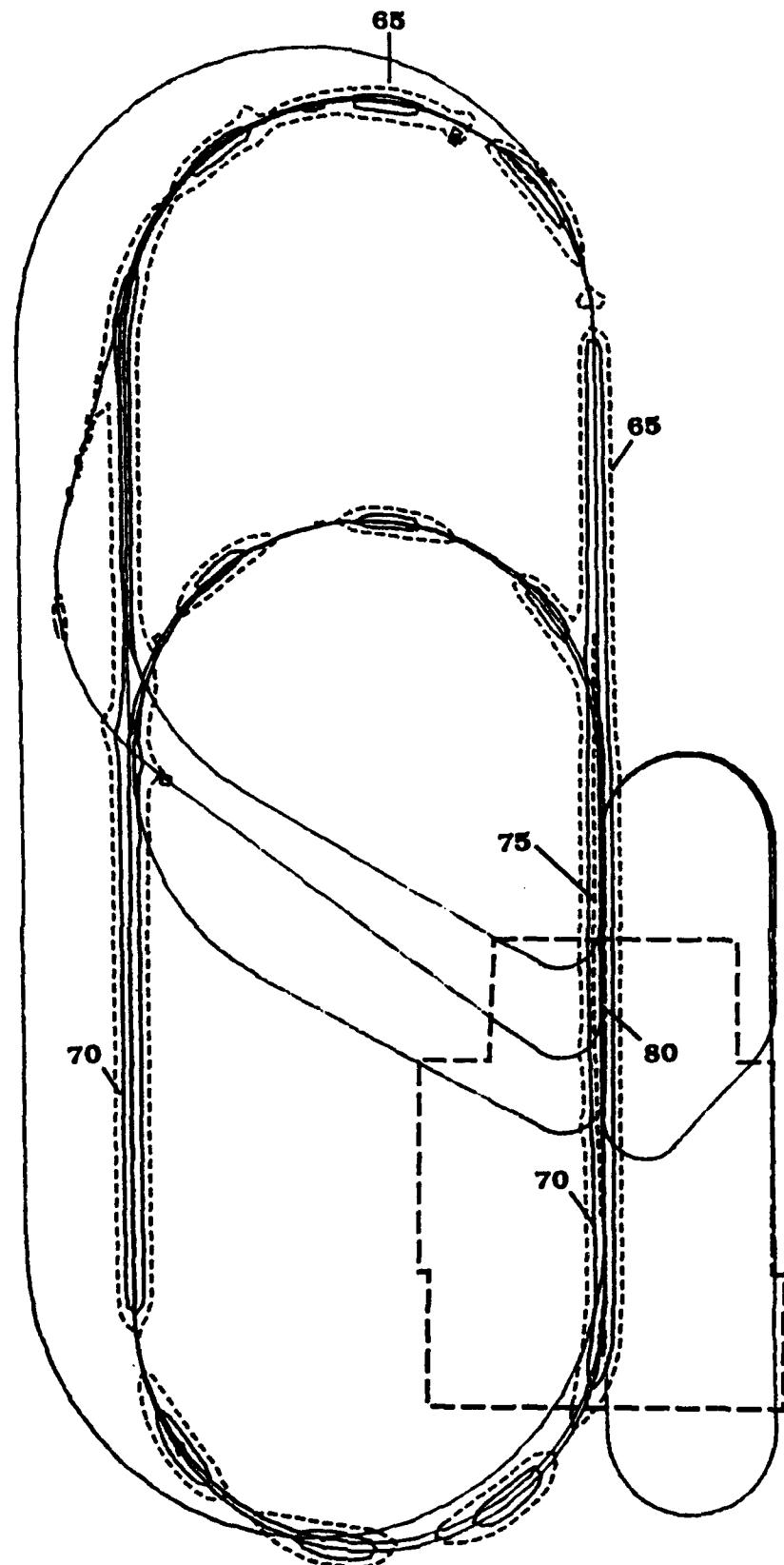
The increased use of airspace, at Cannon AFB, on the MTRs, and within the MOAs and restricted areas, that would result from the Proposed Action and from the 37th FW relocation as applicable, would not have any significant impacts on other air traffic and airspace uses. This is discussed in more detail below for each of the affected airspace areas.

##### 4.1.4.1 Cannon AFB and Environs

The proposed action would result in a 35 percent increase in the number of sorties presently operating from Cannon AFB. Assuming the sortie increase generates a proportional increase in airfield activities (landing, takeoff, touch and go's, etc), annual air traffic operations in the Cannon AFB airspace environment would increase from 60,000 to 81,000 for the radar approach control facility and from 65,000 to 88,000 for the control tower. Such increases would not have any adverse effects on civil air traffic operating at the Clovis or Portales airports, or on other airfields and traffic routes in the area. Likewise, no changes would be required to the existing airspace structure (approach control area, transition area, or control zone) to accommodate these increased numbers of operations. Cannon AFB aircraft currently conduct very limited operations at the Roswell, Lubbock, and Amarillo Airports and the realignment is not expected to create any increased need to utilize these airfields.

##### 4.1.4.2 Affected MTRs

Under the realignment action, there would be no major changes to the current structure of Cannon AFB MTRs. Some entry/exit points on Cannon AFB MTRs which transit the Mount Dora MOA may be redesignated or slightly modified, as necessary, to make the MTRs compatible with MOA use. SAC has established IR-150, which originates within the southwestern portion of the airspace identified for the Mount Dora MOA and then overlaps another SAC route (IR-



**Figure 4.1.3-2 Noise Contours for the Proposed Action at Melrose Range**

**Table 4.1.3-5 Noise Impact Due to Proposed Action  
At Melrose Range**

<b>L<sub>dn</sub> Value</b>	<b>Acres</b>	<b>Square Miles</b>
65.0	60,625.2	94.7
70.0	32,550.9	50.9
75.0	7,410.5	11.7
80.0	210.4	0.3

177), but at lower altitudes, in the eastern side of the MOA. This route is seasonally active March 15 through December 31 and could present a potential scheduling conflict with the proposed Mount Dora MOA use. However, SAC, through Barksdale AFB, LA, plans to modify the initial route segments of IR-150 to deconflict its use with flight operations in the Mount Dora MOA (Tindall, 1991, personal communication). Reese AFB, TX, is in the process of developing four MTRs which will be deconflicted with Cannon AFB airspace through coordination with Cannon AFB and the FAA. Current operating procedures, avoidance locations, and aircraft flight parameters on Cannon AFB MTRs would remain essentially unchanged.

MTRs will experience only slight variations in utilization over current levels. Table 2-4 shows the projected annual number of day and night sorties to be flown by F-111 and EF-111 aircraft on each of the 10 Cannon AFB MTRs. The data show no change in MTR sorties between the 1991 and 1992 baselines. The proposed action would result in 15,121 MTR sorties flown annually, which is an increase of 5,568 sorties (58.3 percent) over the 1991/1992 levels. F-111 aircraft would fly 11,521 (76 percent) of the annual MTR sorties, while EF-111 aircraft would fly 3,600 sorties (24 percent). MTR sorties flown at night would increase from none to 1,211 sorties. Both the F-111s and EF-111s would fly 92 percent of their MTR sorties during daylight hours and 8 percent at night.

The increase in sortie frequency on the Cannon AFB MTR structure would result in an average increase of approximately eight daylight MTR sorties and two night MTR sorties per route per week. The impact of increases of this magnitude on MTR management and scheduling is not considered significant and would not decrease adequate safety margins between scheduled flights. There would be no impacts to commercial aviation as a result of increased MTR activity; however, general aviation VFR air traffic would have to exercise increased vigilance when operating within these MTRs.

#### 4.1.4.3 Melrose Range and R-5104/R-5105

The number of sorties projected for use of the Melrose Range complex under future actions, including relocation of the 37th FW, would result in nearly a 20 percent increase over current levels. The proposed action would further increase this use by another 50 percent. This increased use would have no effects on other air traffic in the area since civil aircraft are restricted from flight within the range airspace when active, and no Federal Airways, visual corridors, or airports are in the vicinity of the range. One Jet Route transits R-5104B; however, altitudes below 23,000 feet MSL (Flight Level 230) are not normally utilized by the FAA along this portion of the route when the range and restricted area are active.

#### 4.1.4.4 Red Rio Range and R-5107B/J

Future actions, including the relocation of the 37th FW, will nearly triple the current use of the Red Rio Range complex. The proposed action would further increase the number of sorties in this range by 30 percent, for a total of 10,486 sorties. While the net increase would be a significant change from the current level of use, this would not have any adverse effects on civil aviation. Nonparticipating civil and military aircraft are restricted from use of this range airspace when it is active. There are no Federal Airways in the vicinity, and any air traffic on the one Jet Route (J-4) that transits south of this range complex would not be adversely affected by the range operations. The FAA assigns to civil aircraft those altitudes on J-4 that are above those in use by the military aircraft in the restricted area. Military aircraft and those VFR civil aircraft operating adjacent to the eastern range boundary near the Carrizozo airfield would need to exercise increased vigilance with the increased use of the range.

#### 4.1.4.5 Oscura Range and R-5107B

Future actions, including the relocation of the 37th FW, will nearly double the current use of the Oscura Range complex. The proposed action would further increase the number of sorties in the range airspace by seven percent, for a total of 9,472 sorties. This increase would not have any adverse effects on civil aviation. Civil aircraft and nonparticipating military aircraft are restricted from use of this airspace when it is active. There are no Federal Airways in the vicinity and use of the Jet Route by the FAA would continue to be as indicated above in the use of the Red Rio Range. Military aircraft operating in or near the range and those civil aircraft operating within the VFR corridor along Highway 54 would need to exercise increased vigilance with the increased use of the range.

#### 4.1.4.6 Mount Dora MOA

Future actions will generate approximately 1,828 sorties in the Mount Dora MOA. The proposed action would generate an additional 7,560 sorties. Such usage is not expected to have any adverse impacts on civil aviation in this MOA. Federal Airways and Jet Routes in this area are adjacent to and above the MOA airspace. Therefore, there would be no effects on instrument air traffic transiting these routes under FAA control. Although civil VFR aircraft are not restricted from operating through MOA airspace, the 1,500 feet AGL floor would provide the opportunity for these aircraft to transit through this area and remain below the MOA when operating at the public/private airports or along the highway "flyways." No data is available on private aircraft traffic operating through the proposed MOA; however, it has been characterized as being low density (Harner, 1991, personal communication).

#### 4.1.4.7 Pecos MOA

The Proposed Action would result in a 75 percent increase in the use of the Pecos MOA. Despite such increased use of this airspace, it would not be

expected to have any adverse effects on other air traffic in the area since the MOA does not conflict with any Federal Airways, Jet Routes, or airports.

#### **4.1.5 Socioeconomics**

##### **4.1.5.1 Cannon AFB**

This section summarizes the socioeconomic impacts of the proposed action on the region consisting of Roosevelt and Curry Counties. Impacts were estimated using demographic assumptions and RIMS II (Regional Impact Modelling System) and earning multipliers described in more detail in a recent report (SAIC, 1990). RIMS II for the Roosevelt/Curry region was provided by the Bureau of Economic Analysis, Department of Commerce, in a format commonly used by the Office of Economic Adjustments, Department of Defense.

###### **4.1.5.1.1 Population**

The proposed action would increase population in the two-county region. Table 4.1.5-1 shows that the number of military households would increase by 986 and the number of civilian households by 42. The number of school aged children would increase by 454 students, and the total population would increase by 2,732 persons, roughly 4.5 percent of the two-county population projected for 1992. Based on historical trends, virtually all (95 percent) of the 386 households not residing on-base would locate in the community of Clovis.

###### **4.1.5.1.2 Employment and Earnings**

The realignment would increase both military and civilian employment in the two-county region. Total employment would increase by 1,637 positions, including 986 military personnel and 651 direct and indirect civilian jobs. This would represent almost a 6 percent increase over baseline employment (including the 1991 realignment) for the two-county region. However, many of the new civilian positions, largely in trade and service industries, would be filled by an estimated 322 working spouses accompanying incoming personnel. Detailed employment and earnings impacts are shown in Table 4.1.5-2. Construction during 1992 and 1993 would support an estimated 77 construction workers and 91 indirect workers through the two-year period.

Earnings in the two-county region would increase by an estimated \$30.3 million. This would amount to roughly a 6 percent increase over baseline \$509 million (\$1990) earnings (including the 1991 realignment increase).

**Table 4.1.5-1 Demographic Impacts of Proposed Action on  
Roosevelt and Curry Counties**

<b>Category</b>	<b>Change</b>
Military Households	986
Civilian Households	42
School Age Children	454
Total Population	2732

**Table 4.1.5-2. Employment and Earnings Impacts of the Proposed Action on Roosevelt and Curry Counties**

<b>Category</b>	<b>Change in</b>	
	<b>Employment</b>	<b>Earnings</b>
<b>Military Personnel</b>	986	\$20,587,369
<b>Civilian Workers</b>		
<b>Appropriated Funds</b>	42	\$1,130,705
<b>NAF/Base Businesses</b>	89	\$705,913
<b>Contractors</b>	0	\$0
<b>Indirect</b>	520	\$7,904,654
<b>Total Military and Civilian</b>	<b>1637</b>	<b>\$30,328,641</b>

During the scoping meeting, concern was raised with respect to perceived damage from fuel jettisoning to the roofs of commercial businesses in the vicinity of Cannon AFB. An analysis of fuel dumping is presented in Section 4.1.2. Based on this analysis, it is concluded that the proposed action would not have a significant impact on commercial business operations or damage roofs of commercial businesses as a result of fuel jettisoning.

#### 4.1.5.1.3 Housing

The proposed realignment would increase the demand for housing in the region by an estimated 1,028 units. This demand would consist of an estimated 292 single enlisted personnel, 504 households seeking rentals, and 232 households expecting to purchase a home. These estimates are based on housing tenure patterns described in a recent study of the Cannon AFB housing market (SAIC, 1989). Table 4.1.5-3 summarizes housing impacts in Curry and Roosevelt counties.

The demand for off-base rentals due to incoming families would not be satisfied by the estimated vacancies available in Clovis and Portales. After accounting for the 350 new 801- program units there would be a remaining unmet demand for 154 rentals. A recent study of the Cannon AFB housing market area found that the realignment would increase demand for rental units for specific grades that are already experiencing a shortage of suitable homes (SAIC, 1992). By FY 92/4, there will be deficits of over 400 one- to two-bedroom units suitable for senior enlisted families. A short-term deficit of three-bedroom units for senior enlisted families will be somewhat attenuated by additional 361 MFH units currently programmed for FY93, to be completed in FY 94/4.

No long-term problem is anticipated in accommodating the unaccompanied enlisted personnel. The 300 new dormitory units scheduled for completion in late 1993 should meet the needs of the additional 292 single enlisted personnel; 200 of the new units were completed in FY 91, and 100 units (with space for 200 persons) are currently programmed for FY 93. Short-term dislocation would occur if these personnel arrive earlier than the completion of the new dormitories. Single enlisted personnel would necessarily be housed off-base, increasing the competition for local rentals.

#### 4.1.5.1.4 Community Services

##### Community Services in the City of Clovis and Curry County

Basic community services would likely be strained under both scenarios by the projected increase in population resulting from realignment, particularly in the short term. Staff from the Office of Economic Adjustment, Department of Defense, are currently working with community representatives for Clovis and Portales to plan for, mitigate, and monitor anticipated increases in population. Local officials welcome the realignment and expect the long-term community impacts to be beneficial.

**Table 4.1.5-3 Housing Impacts of the Proposed Action on Roosevelt and Curry Counties**

<b>Housing Types</b>	<b>Change in Units</b>
On-Base	
UPH	292
MPH	350
Off-Base	
Owner Occupied	232
Rentals	154
<b>Total</b>	<b>1028</b>

**Note: Distribution of housing preferences based on TAC 1990.**

**This analysis assumes that 300 new dormitory units and 350 801-type units will be available in late 1992.**

Services that require a long lead time in planning for increased equipment, buildings, or the hiring of qualified personnel would be most likely to feel the strain. Services that would likely be less seriously affected are those such as recreation and medical care where new military personnel have access to base services. City services particularly affected would include jail, police, fire, and ambulance services.

### Community Services in Portales

Almost all in-coming population would reside in Clovis or on Cannon AFB. Any increase in demand for community services in Portales would be negligible.

### Medical Services

The impact on area medical services would be reduced by the extent to which the Cannon AFB hospital is able to provide medical care to military beneficiaries in the community. The base hospital has expansion capacity that could more than double its current inpatient bed space, while the expected increase associated with the action would represent an increase of less than 30 percent over the current population of active duty personnel, retirees, and dependents who are eligible for base hospital benefits. Additionally, expansion of outpatient facilities by 20 to 40 percent, based on staffing projections, would accommodate the increased demand from military families expected with the action. The community hospitals would experience increased demand from the influx of civilians expected and from the proportion of military dependents who choose to use civilian rather than military hospitals. Occupancy rates at the two community hospitals indicate sufficient availability of bed space to absorb the increased demand, as confirmed by hospital administrators.

#### 4.1.5.1.5 Utilities

With the exception of wastewater treatment, realignment is not expected to impair utilities' ability to serve the additional load imposed. The new wastewater facility is scheduled for construction in FY 95 and will improve the handling of wastewater discharge on base and meet RCRA requirements. Overall, utilities serving the two-county area are capable of handling continuing growth, including the impact of the realignment, through the end of the century. However, additional industrial demand could exceed wastewater treatment capacity.

Both Portales and Clovis have large water pumping reserves. Gas and electric utilities also have large reserves. Wastewater treatment capacity reserve of 0.8 million gallons per day (mgpd) in Clovis would accommodate additional households, but may not accommodate both additional households and new major industries. Portales also has minimal wastewater treatment capacity reserve. Extra households can be accommodated, but additional industrial demands may exceed the capacity.

#### 4.1.5.1.6 Education

##### Clovis Municipal School District

The proposed action would increase by 454 the number of school-aged children in the two county region. Almost all of these new students would reside in Clovis or Cannon AFB and would attend schools in the Clovis Municipal School District. This would represent a 9.4% increase over the 7,874 student population of the district in 1990. Such an increase would require additional staff and possibly the expansion of facilities.

Although school officials expect that in the long term the school district would benefit from growth, in the short-term, impacts may be negative. USAF is working with staff from the Office of Economic Adjustment, Department of Defense, and with community representatives to monitor and mitigate the severity of the impact to the schools. Additionally, the underlying basis of community support for the military and for the Cannon AFB realignment may be expected to facilitate the adjustments that would be required.

##### Portales Municipal School District

Depending upon residential patterns, a small number of students may be added to the Portales Municipal District. District officials believe that the additional students could be served with minimum hardship to the district (Overby, 1989b, personal communication).

#### 4.1.5.1.7 Public Finance

This section discusses in general terms the impacts that each community is likely to experience as a result of the realignment. The purpose of this discussion is to pinpoint problems that could occur in public finance as the communities adjust to different patterns of revenues and expenditures. Clovis and, to a lesser extent, Curry County, would experience almost all impacts to public finance. Portales would experience little impact.

Two general types of impact would be likely to occur in situations of rapid, military-related growth. In the short term, communities would be likely to experience a lag between receipts of revenues and the need for expenditures. Over the longer term, public revenues may expect to receive a lower per capita contribution from military as compared with civilian residents. This section evaluates these general types of impacts in the context of the New Mexico tax structure.

Public finances may be impacted in the short term by the need to fund additional community services required by the influx of population. Planning and financing of services would be required prior to receipt of tax dollars from new residents, if the influx is to be managed without detriment to community quality of life. Two features of the current fiscal situation may be expected to facilitate this process. First, both cities are fiscally sound. Each has available full

general obligation bonding capacity to finance capital and service improvements. Second, the reliance of each city on user fees would tend to relieve the burden on public taxes. However, a possible disadvantage in the current context is the dependence of local governments on revenues from the state. The redistribution of these shared taxes may be less immediately responsive to local needs.

In the long term, public finances may expect to recoup less revenue per capita to fund services for military as compared with civilian residents. Differences in military and civilian revenue patterns are particularly relevant in planning for future community expenditures, given that the majority of new residents would be military rather than civilian. Two aspects of these differences in revenue patterns are noteworthy.

A first difference is that a lower percentage of military as compared with civilian residents own homes on which property taxes are paid. Data on current Cannon personnel show that 27 percent of total families own their homes (Housing Management Office, 1988); the civilian norm is 64 percent (Smith, Rosen, and Fallis, 1988: 35). The effect of this lower propensity to own homes may be reduced in the current context because of the lesser dependence of the affected cities on property taxes than service charges as a source of revenue. A second difference is that many purchases by military personnel are made on-base rather than in the community. For example, a recent survey of personnel at Mather AFB, CA, showed that the greater proportion of respondents purchased day-to-day items such as groceries, gas, and medical purchases on-base; durables, cars, and furniture were the items most frequently purchased in the community (Department of the Air Force, 1987). Similar types of spending patterns by Cannon AFB personnel would reduce the amount of additional revenue to be gained from gross receipt taxes, on which the two city governments depend for over 60 percent of revenue.

#### 4.1.5.1.8 Transportation

Increased traffic resulting from realignment is not expected to result in a significant negative impact on the road network in the vicinity of the base. However, service levels may decline during peak traffic, with drivers experiencing reduced speeds and queuing at intersections where there is traffic control. Similar effects may occur on local streets in Clovis, especially on 7th Street. The major potential impact from increased base traffic is expected to occur at the base interchange, where the facility appears inadequate to accommodate the increase. The situation may require monitoring by local military personnel, who would be the primary persons affected.

#### 4.1.5.2 Selected MTRs

Proposed flight activities would not directly affect the local population or economies of areas beneath the selected MTRs. However, public acceptance of aircraft overflights may be affected by the proposed increase in sorties. This would largely be due to noise impacts, discussed in detail in Section 4.1.3.

EF-111 aircraft, as a provider of electronic countermeasures in support of tactical forces, make use of electromagnetic emissions in order to detect and render ineffective battlefield acquisition radar units. EF-111 aircraft using the MTRs may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

#### **4.1.5.3 Melrose Range**

Proposed flight activities would not directly affect the local population or economies of areas near the Melrose Range. However, public acceptance of overflights and activities at the range may be affected. This would largely be due to noise impacts, discussed in detail in Section 4.1.3.

EF-111 aircraft using the Range may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

#### **4.1.5.4 Red Rio Range**

Proposed flight activities would not directly affect the local population or economies of areas near the Red Rio Range. However, public acceptance of overflights and activities at the range may be affected. This would largely be due to noise impacts, discussed in detail in Section 4.1.3.

EF-111 aircraft using the Range may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

#### **4.1.5.5 Oscura Range**

Proposed flight activities would not directly affect the local population or economies of areas near the Oscura Range. However, public acceptance of overflights and activities at the range may be affected. This would largely be due to noise impacts, discussed in detail in Section 4.1.3.

EF-111 aircraft using the Range may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

#### **4.1.5.6 Mount Dora MOA**

Proposed flight activities would not directly affect the local population or economies of areas near the Mount Dora MOA. However, public acceptance of overflights and activities within the MOA may be affected. This would largely be due to noise impacts, discussed in detail in Section 4.1.3.

EF-111 aircraft using the MOA may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

#### **4.1.5.7 Pecos MOA**

Proposed flight activities would not directly affect the local population or economies of areas near the Pecos MOA. However, public acceptance of overflights and activities within the MOA may be affected. This would largely be due to noise impacts, discussed in detail in Section 4.3.

EF-111 aircraft using the MOA may carry out training activities using the electronic countermeasures systems. Electromagnetic interference may occur to civilian aircraft flying in the vicinity of the affected MTRs. ACC has frequency management procedures in place to minimize this problem. No adverse impacts from this source are therefore expected.

### **4.1.6 Biological Resources**

#### **4.1.6.1 Cannon AFB and Environs**

No significant impacts to biological resources associated with Cannon AFB would be expected as a result of realignment.

Construction of new facilities on the base would be the only action to affect plant or wildlife resources. Proposed construction would result in the loss of vegetation cover over approximately 230 acres. The areas affected by this action have been previously disturbed by human activity to the point that cultivated species comprise almost all of the vegetation at these locations. The loss of vegetation in these areas would not constitute a significant loss of wildlife habitat or food supply. Given the small scale of construction activities, direct construction-related mortality to wildlife would be negligible. It is reasonable to assume that wildlife in the near-base environment are already adapted to flight operations. Increased flight operations from the proposed action would not be expected to adversely impact wildlife resources.

Three species of plants listed by the State of New Mexico as "Endangered" or "Sensitive" are found within a 50-mile radius of Cannon AFB. At the present time, no survey of the presence or abundance of these plants has been made on the base. Because of long-term disturbance of the areas in which

construction would take place, the presence of protected species of plants or animals is not likely.

#### 4.1.6.2 Affected MTRs

Table 4.1.6-1 summarizes the change in sortie rates and resulting noise exposure under the affected MTRs under the proposed action. Projected noise levels would range from Ldnmr 57 to 63 dB under all affected MTRs. The largest projected increase in Ldnmr noise levels is 8 dB on VR 100/125, and 9 dB on IR-110; increases on other affected MTRs range from Ldnmr 2 to 7 dB. While the increase in noise levels on some of the MTRs would be large, the resulting noise levels would all be less than Ldnmr 65 dB and are not considered to be biologically significant.

The average number of sorties on most of the MTRs would increase by 1 to 3 sorties per training day (assumes 220 training days per year). Sortie rates on VR-114 would increase by 6 sorties per day; those on VR-100/125 would increase by 5 sorties per day. About 45% of these sorties (roughly 2 to 3 sorties per day) would occur at altitudes of less than 1,000 feet. These additional sorties would be spread out over the width of the affected MTRs. The width of these MTRs is typically 10 nm or more, so that any given point would be overflowed relatively infrequently. The corridor width for portions of VR-100/125 however, is only 3 nm, and some areas would receive several additional low-level sorties each day. This portion of the route crosses the Pecos River drainage a few miles north of Bitter Lakes NWR, an area with abundant waterfowl.

Canyon Colorado Equid Sanctuary (CCES) underlies the western side of the IR-107 corridor. This MTR currently receives approximately 10 sorties per day. On the basis of the expected altitude distribution, an estimated four of these sorties occur at altitudes less than 1,000 feet AGL. Assuming random distribution of flights, it would be expected that the CCES would be overflowed by approximately 2 low-level (less than 1,000 feet) sorties per training day under the 1990 Cannon Realignment action. Using the same assumptions, the proposed action would result in approximately 1 extra sortie every other training day. Low-level overflights would therefore increase by about 25%.

Several MTRs cross wetland areas, particularly in the Pecos River Valley, which sustain dense bird populations. Adverse impacts to these populations through bird-aircraft strike are not, however, expected. Nationwide, collisions between birds and military aircraft are notably infrequent. Locally, about 70 airstrikes are recorded annually in the affected MTRs. This low frequency of bird-aircraft collisions is in part due to existing flight rules designed to prevent such events.

The Air Force recognizes the potential adverse effects of bird aircraft strikes on birdlife as well as on aircraft and crew. As a result the Air Force goes to considerable length to avoid such effects. Cannon AFB has established bird-aircraft strike hazard procedures (27th TFW, 1991) governing aircraft operations in the areas of concern. These procedures include briefing pilots concerning

**Table 4.1.6-1 Change in Sorties and Resulting Noise Levels on Affected MTRs**

MTR	Width (nm)		Change		Resulting Level dB
	Minimum	Typical	Sorties Per day*	Noise dB	
IR-107	15	15	2	3	62
IR-109	4	8 to 10	1	3	60-63
IR-110	8	10	3	9	57
IR-111	8	8 to 12	2	3	60
IR-112	9	10	1	7	55
IR-113	8	10	<1	2	60
VR 100/125	3	10 to 56	5	8	59-62
VR-108	10	15	1	5	57
VR-114	30	30-40	6	5	63

\*Assumes 220 training days per year.

time and place of bird activity, and modifying flight paths and timing of flights in areas of greatest hazard. Given the infrequency with which bird aircraft strikes presently occur, the relatively slight increase in sorties in the affected MTRs is unlikely to significantly increase bird-aircraft collisions. As a result, no adverse impact to the avifauna would be expected.

Elsewhere, some of the MTRs traverse several mountain ranges and valley systems that sustain year-round populations of elk, mule deer, black bear, and a wide variety of non-game species. North-South oriented ridges provide important migration routes, as well as nesting and foraging habitat for raptors. Existing flight rules for MTRs incorporate seasonal restrictions on aircraft operations designed to avoid wildlife sensitive areas, particularly during breeding periods. Since the proposed action does not involve creating new airspace, existing seasonal restrictions should be adequate to protect wildlife resources.

EF-111 aircraft, as a provider of electronic countermeasures in support of tactical forces, make use of electromagnetic emissions in order to detect and render ineffective battlefield acquisition radar units. EF-111 aircraft using the MTRs may carry out training activities using the electronic countermeasures systems. Given the aircraft altitude and speed, low power levels of the countermeasures systems, and the small duration of any possible radiofrequency radiation exposure, no adverse impact to human health or to the biota would be projected for this source under the realignment action.

The Mexican spotted owl has been proposed for listing as a threatened species. This species is known to inhabit (primarily in wooded canyon floors) the region over which proposed air operations out of Cannon AFB take place. The Air Force is required by the Endangered Species Act to determine if its current or proposed actions are likely to jeopardize the continued existence of any species proposed for listing or result in the destruction or adverse modification of critical habitat proposed to be designated for such species, and, if such impacts are likely, to confer with the U.S. Fish and Wildlife Service to resolve potential conflicts. Considering that the proposed activities involve moderate changes in activities on aircraft training routes that have been in operation for extended periods, and that the primary reason for the owls' population decline is habitat destruction by logging, it is the opinion of the Air Force that the proposed action should not jeopardize the owls or their habitat, and that any impact will be minimal and insignificant. The obligations of the Endangered Species Act are continuous, however, and the formal listing of the species, or the development or discovery of additional information regarding them, will be cause for re-addressing this issue.

#### 4.1.6.3 Melrose Range

Given the limited scale of construction on Melrose Range under the proposed action, no significant impact to area biota would be expected from this source. Practice bombing, target placement, and periodic disposal activities would

affect vegetation and wildlife habitats, but the effects would be confined to areas of existing, ongoing impacts of a similar nature. Any incremental increase in local disturbances from these activities to the shortgrass prairie at the Range is considered insignificant.

Under the proposed action the area encompassed by the Ldn 65 dB noise contour would expand from about 42 square miles (1991 baseline) to about 95 square miles. Part of the increase is due to other actions being taken at Melrose Range; the area within the Ldn 65 dB contour in the projected 1992 baseline is about 70 square miles. Thus, even though the range target area would not increase, the area exposed to high noise levels would increase substantially. It is reasonable to assume that the resident range wildlife is already adapted to a high level of noise exposure. At most, the effect of this increase would be to cause some displacement of wildlife away from the range target areas. The area which is suitable for domestic cattle grazing may be reduced under this action due to increased noise levels; however, cattle grazing is considered an appropriate land use up to Ldn 80 dB. Existing Range operations have not affected the continued habitation of the Melrose Range by two golden eagles. Proposed operations are not anticipated to affect the continued survival of this pair.

The use of chaff and flare could result in an adverse impact to the vegetation, wildlife, and domestic cattle on the Range. The use of magnesium flares dropped by aircraft during some training missions over Melrose Bombing Range could result in fires in woodlands and grasslands in range areas. The minimum altitude at which flares would be authorized to be released is 700 feet AGL (in accordance with ACC Regulation 55-79). The flares are designed to burn out within 300 feet after ejection from the aircraft. The potential for a live flare reaching the ground and initiating a brush fire is considered slight. The potential for dud, flares reaching the ground and igniting on impact is remote since the flare type to be used cannot leave the aircraft unless it is ignited. Since past training activities on the range have included the use of flares, this activity does not represent a new source of impact. Given this, and the low probability of occurrence, impacts from this source are considered negligible.

Brush fires ignited by flares released from aircraft during range training activities, though considered rare events, could result in loss or displacement of fauna. Changes in plant species composition and the quantity and quality of plant growth following a fire would be of greater potential consequence to the fauna of the area. These changes could benefit some species and be detrimental to others. Since the use of flares is not a change over past training practices on Melrose Bombing Range, flare induced fires are not considered a significant source of impact.

Chaff ejected during activities over ranges, and aluminum chaff fragments resulting from physical degradation of chaff fibers, could be ingested or inhaled by animals. Chaff is composed of extremely fine fibers of aluminum coated fiberglass. The fiberglass fibers are nearly pure silicon glass drawn to a fine thread. The aluminum coating composes about 30% of the chaff fiber. Neither

fiberglass nor aluminum are considered toxic materials (Venugopal and Luckey, 1978; Browning, 1969). Oral ingestion of chaff would not be expected to cause adverse impacts to livestock or wildlife. Exposure to fiberglass dust (from breakup of chaff bundles) might result in irritation of skin, eyes, ears, nose, or throat, through mechanical irritation. Manmade fibers such as fiberglass are considered to be substantially less hazardous to domestic animals and wildlife than asbestos (West, et al, 1988). No impacts to the fauna would be expected from this source.

EF-111 sorties utilizing electronic countermeasures on the Range should not result in adverse impact to human health or to the biota (see the discussion of electronic countermeasures in Section 4.1.6.2).

#### 4.1.6.4 Red Rio Range

Under the proposed action the noise level under Red Rio Range would increase to  $L_{dn}$  72 dB or 2 dB, above the level projected for the 1992 baseline conditions. It is reasonable to assume that the biota of the area are already acclimated to the high noise levels of the bombing range. The projected increase in noise level is not seen as significant for the biota. Sorties over the range would increase by about 12 sorties per day over the projected 1992 baseline. Given the high level of existing activity on the Range, no adverse impact from increased overflight would be expected. The use of chaff and flares on Red Rio Range should not result in any adverse impact to the wildlife of the area (see the use of chaff and flares in Section 4.1.6.3).

EF-111 sorties utilizing electronic countermeasures on the Range should not result in adverse impact to human health or to the biota (see the discussion of electronic countermeasures in Section 4.1.6.2).

#### 4.1.6.5 Oscura Range

Under the proposed action the noise level under Oscura Range would increase negligibly above the level projected for the 1992 baseline conditions. Biota of the area are already acclimated to the high noise levels of the bombing range, and no noise related adverse impact to the biota is projected. Sorties over the Range would increase by about 3 sorties per day over the projected 1992 baseline. Given the high level of existing activity on the Range, no adverse impact to the biota from increased overflight would be expected. The use of chaff and flares on Oscura Range should not result in adverse impact to the wildlife of the area (see the use of chaff and flares in section 4.1.6.3).

EF-111 sorties utilizing electronic countermeasures on the Range should not result in adverse impact to human health or to the biota (see the discussion of electronic countermeasures in section 4.1.6.2 ).

#### 4.1.6.6 Mount Dora and Pecos MOAs

The proposed action involves no ground disturbing activities under Mount Dora MOA, and no adverse effect on vegetation would be expected. Mount Dora MOA is not currently active, and the introduction of aircraft operations under this proposed action would result in new exposure of wildlife to overflight and increased noise levels. Projected noise levels for the area under the proposed action would increase from background ambient levels of Ldn 46 dB to 59 dB. These resulting noise levels would not be considered biologically significant and should not adversely affect wildlife in the area.

The proposed action would result in approximately 40 sorties per training day at Mount Dora MOA (assuming 220 training days per year). An additional 28 sorties per training day will be added to Pecos MOA. The lowest altitude at which these sorties would be flown would be 1,500 feet AGL. At this level, startle effects from overflight would not be a significant issue for any species. No impact to the equid species in the CCES under Mount Dora MOA would be expected. Some bird species in the area routinely fly at altitudes above the floor of the MOA. As a result, bird-aircraft strike could be a potentially significant issue for these species. Species of potential concern include Canada and snow geese, bald and golden eagles, and the peregrine falcon. Large concentrations of migrating Canada and snow geese are found along the rivers and around the reservoirs in the area from mid-September to March. The peak fall migration occurs from October through early December and spring migrations occur from mid-February to early April. The golden eagle is probably found year round in the MOA area. The largest concentrations of eagles in New Mexico are in the northeastern counties underlying Mount Dora MOA. In these areas they are found in greatest concentrations near reservoirs and along rivers where they often soar to elevations in excess of 1,500 feet. Peregrine falcon are present in the area, but at very low population densities.

EF-111 sorties utilizing electronic countermeasures on the MOA should not result in adverse impact to human health or to the biota (see the discussion of electronic countermeasures in section 4.1.6.2).

#### 4.1.7 Water Resources

In the absence of ground disturbing activities, the proposed action would not be expected to have any direct impact on water resources in the areas underlying the affected MTRs and MOAs. This section evaluates impact on water supply and quality, due to base construction, increased population in the vicinity of Cannon AFB, and increased utilization of Melrose, Oscura, and Red Rio Bombing Ranges. No significant impact to water resources was found for these aspects of the proposed action.

##### 4.1.7.1 Cannon AFB and Environs

The surface water features on and around Cannon AFB are small depressions known as playas. Surface water runoff drains to these depressions forming

temporary "lakes" until the water infiltrates or evapotranspires. There is one large playa (Playa Lake) on Cannon AFB which receives most of the surface water runoff from the base and is the on-base surface water (temporary "lake") feature. The on-base construction activities (resulting from Realignment) would not be anticipated to adversely affect Playa Lake. The increase in surface water runoff resulting from additional roads and buildings would not be detectable above existing conditions at Playa Lake and would not be anticipated to have any short or long term adverse effect upon this resource.

Water supply in this area comes primarily from water stored in the Ogallala aquifer. The semiarid climate with low rainfall (approximately 15 inches/yr) and reported low recharge (about 1 inch per year, EPA, Drastic, 1987) cannot replenish the area groundwater resource at the rates of withdrawal experienced in the last 40 years and have resulted in declining water levels in the aquifer. Impacts to the groundwater resource become more severe with increasing withdrawal.

The base water supply is drawn from on-base wells. The remaining useful life of these wells was projected in a 1985 study (William Matotan and Associates, 1985). This study assumed a growth of 133 persons per year between 1985 and 2000. On this basis, a remaining useful life for most of the active wells was estimated at 20 to 50 years. It is expected that base population would grow by 292 persons under the proposed action. Over recent years Cannon AFB has not experienced the expected growth. The addition of 292 on-base personnel would not be expected to result in a reduction in remaining useful well life beyond that projected in William Matotan and Associates, 1985.

Operation and maintenance of the additional aircraft would require approximately an additional 190,000 gpd water. A water supply study for Cannon AFB has been commissioned (Richards, 1989, personal communication) to evaluate the existing water supply system and provide recommendation(s) to meet Cannon AFB water demand.

The total FY94 population increase as a direct result of the action is projected to be 2,732 people. This increase in local population (Cannon AFB and surrounding communities) would increase local water demand by approximately 410,000 gpd (2732 X 150 gpd/person). The withdrawal of this additional volume of water from the Ogallala Aquifer would not have an adverse affect upon the local water resources. Of this, 366,000 gpd would be met by local utilities.

#### 4.1.7.2 Affected MTRs

The proposed action does not involve construction or other action which could lead to impact on surface or groundwater supplies in the areas underlying the affected MTRs. No impact to water resources is therefore projected for these areas.

#### **4.1.7.3 Melrose, Red Rio, and Oscura Ranges**

There are no permanent surface water bodies located within the boundaries of affected Ranges. The increased use of the Ranges under the proposed action would not be expected to have any adverse affect upon the water resources on the Range. The inert munitions delivered during training exercises do not represent a significant source of pollution to surface or groundwater. In the absence of surface water features, proposed construction on Melrose Range would not adversely affect water resources of the area.

#### **4.1.7.4 Mount Dora and Pecos MOAs**

The proposed action does not involve construction or other action which could lead to impact on surface or groundwater supplies in the areas underlying Mount Dora MOA and Pecos MOA. No impact to water resources is therefore projected for this area.

### **4.1.8 Archaeological Resources and Native American Values**

#### **4.1.8.1 Archaeological and Historical Resources**

##### **4.1.8.1.1 Cannon AFB and Environs**

Military construction on-base would be located adjacent to existing facilities and impacts to archaeological and historical sites would be unlikely. The cultural resource survey work already undertaken on Cannon AFB (Trierweiler, 1988) located no sites eligible for listing in the NRHP. In light of the significant earlier disturbance of the ground surface throughout the Base and the nonstratified nature of sites already located, it is unlikely that any remaining sites maintain the integrity and significance for listing on the NRHP.

The New Mexico State Historic Preservation Officer has reviewed construction activities at Cannon AFB under this action. The following conclusions were reached:

No properties entered in or determined eligible for inclusion in the National Register of Historic Places would be affected by any of the described construction projects. None of the existing buildings affected by or in the immediate vicinity of any of these projects appears to meet any of the criteria of eligibility for inclusion in the National Register. None of the existing Cannon AFB structures identified as being potentially eligible for inclusion in the National Register would be affected by proposed construction activities.

All of the described projects are located in areas previously disturbed by base construction or other land modifying activities. I believe it is highly unlikely that any significant archaeological or historical sites would be located within the project areas of effect. It is therefore my opinion that

the proposed undertaking would have no effect on any historic properties. (Merlan, 1991)

#### **4.1.8.1.2. Affected MTRs**

Use of VR-100 and VR-125 could result in potential noise and vibration effects at the Gran Quivera Unit of the Salinas Pueblo Missions National Monument. Increased noise could disturb visitors to the Monument if flights came closer than 2,000 horizontal or vertical feet. Although unlikely, vibration effects could occur if planes flew over standing ruins at altitudes less than 400 feet AGL. Similar impacts could also occur at the Wupatki National Monument.

To reduce the potential for significant annoyance impacts, USAF will continue to avoid overflight of the Gran Quivera Unit of the Salinas Pueblo Missions National Monument and the Wupatki National Monument to the maximum extent possible commensurate with mission requirements.

#### **4.1.8.1.3 Melrose, Red Rio, and Oscura Ranges**

Potential actions that could affect archaeological and historical resources at the ranges would be limited to the construction of a training building at Melrose Range. The potential for impact is considered negligible due to the apparent low density of sites in the area (Mariah Associates, 1988).

Increased bombing impacts due to increased use of the Red Rio and Oscura Ranges would be unlikely due to the lack of archaeological and historical resources in bombing target areas (Kirkpatrick, 1987).

The blanket consultation described in Section 4.1.8.1.1 would ensure protection to any remaining, undiscovered sites in the areas to be affected by ground disturbance.

#### **4.1.8.1.4 Mount Dora and Pecos MOAs**

No significant impacts would be expected from overflights due to the lack of supersonic flight and a minimum altitude of 1,500 AGL in Mount Dora. The Pecos MOA lacks noise-sensitive resources except for the Fort Sumner State Memorial. Noise impacts to this resource are avoided by special operating procedures that exclude nearby flights below 1,500 feet AGL.

#### **4.1.8.2 Native American Values**

##### **4.1.8.2.1 Cannon AFB and Environs**

The negligible potential for impacts to archaeological sites on-base (see Section 4.1.8.1.1) indicates that no significant impacts to Native American values would be expected.

#### **4.1.8.2.2 Affected MTRs**

The proposed action would increase sorties on IR-109 by 188 sorties/ yr. Twenty linear miles of this IR follow the Continental Divide as it crosses the southeastern corner of the Jicarilla Apache Reservation. The high altitude and distance from population centers as well as the small increase in annual flights indicate that the proposed action would not significantly affect the reservation.

Increased use of IR-112 could affect cultural values of the Navajo and Hopi. Sortie rates are proposed to increase from 161 to 411 per year. This increase could interfere with seasonal Hopi ceremonies associated with the sky, rain, and associated deities and could adversely affect Navajo perceptions of balance and harmony with the universe, which could lead to perceived illness.

Consultations with the Navajo and Hopi would allow noise-sensitive areas or periods to be avoided. Based on a history of demonstrated cooperation between the Air Force and local tribes, significant impacts would be not expected.

#### **4.1.8.2.3 Melrose, Red Rio, and Oscura Ranges**

Section 4.1.8.1.3 indicates there is only a low-to-negligible potential that archaeological remains would be encountered. Because considerable time and distance separate contemporary Native Americans (Jicarilla Apache, Comanche, and Mescalero Apache) from these areas, and because it is difficult to confidently identify sites left by these formerly nomadic groups, no significant impacts would be expected.

#### **4.1.8.2.4 Mount Dora and Pecos MOAs**

The Jicarilla Apache have previously indicated that subsonic use of the proposed Mount Dora MOA was not of concern. The Comanche tribe of Oklahoma indicated some concern but failed to be specific. Neither tribe has expressed concern about continued use of the Pecos MOA.

### **4.2 ALTERNATIVE LOCATIONS**

The only ACC bases within the CONUS which currently support F-111 or EF-111 missions are Cannon AFB and Mountain Home AFB. Previous decisions have led to the scheduled removal of EF/F-111 planes from Mountain Home. The only remaining base that could receive the affected F-111's and EF-111's is Cannon AFB. As a result, selection of an alternate site for beddown of the affected aircraft is not considered feasible and no impact analysis of this alternative is required.

### **4.3 DELAYED ACTION**

All activities under the delayed action alternative are identical to those described for the proposed action. The only difference would be that under the delayed action alternative, some activities would be delayed. In most cases, the delay

would amount to no more than 6 months. In no case would this affect the nature or magnitude of the impacts experienced. Impacts under the delayed action alternative would not be distinguishable from those arising under the proposed action, though they would occur at a later date.

#### **4.4 NO ACTION**

Under the no action alternative conditions would remain identical to those currently found at Cannon AFB and under the affected airspace. Those adverse impacts that would arise under the proposed action would not occur, but neither would the beneficial socioeconomic effects.

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## 6.0 LIST OF PREPARERS

This chapter lists the preparers of this document. Each individual who made a significant contribution to the development, preparation, or drafting of the document is included in the listing. The professional credentials of each author are provided along with the person's specific contribution.

P.S. Lufkin	M.S., Political Science and Economics, University of California; B.A., Political Science, University of California; 14 years of experience in environmental impact assessment.	Socioeconomics
J. Rush	M.S., Planning, University of Tennessee; B.A., Sociology/Psychology, Maryville College; 2 years of experience in environmental impact assessment.	Land Use
W.M. Willis	Ph.D., Marine Ecology, Old Dominion University; M.S., Biological Oceanography, Old Dominion University; B.S., Biology, College of William and Mary; 23 years of experience.	Contractor Project Manager, Biological Resources
C. Woodman	Doctoral Studies in Anthropology, University of California, Santa Barbara; M.A. Anthropology, University of California, Santa Barbara; B.A., Anthropology, Wichita State University; 16 years of experience in archaeology, cultural resource law, environmental planning and impact analysis, and Native American concerns.	Archaeological, Cultural and Historical Resources
S. Warner	A.A., Los Angeles Valley College; Van Nuys, California; 3 years experience in proposal generation and document coordination.	Document Coordinator

B. Cook	B.S., Chemistry, Central Arkansas State University; 2 years experience in Environmental Impact Analysis.	Project Officer
M. Lucas	B.S., Physics, Moravian College; M.S., Mechanical Engineering, Lehigh University; M.S., von Karman Institute for Fluid Dynamics, fellowship USAF; 6 years experience sound and vibration, flow-induced vibration.	Noise Analysis
A. Hasen	B.S., Chemical Engineering, University of Arizona; 10 years experience air quality and air pollution.	Air Quality Analysis

**APPENDIX A**

**MILITARY TRAINING ROUTE  
SPECIFICATIONS**

**IR-107**

**ORIGINATING ACTIVITY:** 27 TFW/DOR, Cannon AFB, NM 88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU, Cannon AFB, NM 88103-5129 AUTOVON 681-2276, nights/weekends 681-2253.

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assign to	A	TCC 041/19	35°22.5'N 103°17.0'W
Start desc to be at or below 100 MSL at	B	TCC 015/28	35°36.0'N 103°20.0'W
01 AGL B 90 MSL to	C	DHT 237/43	35°50.0'N 103°21.5'W
01 AGL B 90 MSL to	D	DHT 243/56	35°51.0'N 103°39.0'W
01 AGL B 90 MSL to	E	DHT 261/65	36°08.0'N 103°52.5'W
01 AGL B 80 MSL to	F	DHT 274/66	36°23.0'N 103°51.0'W
01 AGL B 80 MSL to	G	DHT 286/58	36°32.5'N 103°35.5'W
01 AGL B 80 MSL to	H	DHT 319/45	36°45.0'N 103°00.0'W
01 AGL B 80 MSL to	I	DHT 323/52	36°53.0'N 103°00.0'W
01 AGL B 80 MSL to	J	TBE 168/20	36°55.0'N 103°36.0'W
01 AGL B 100 MSL to	K	TBE 188/26	36°51.5'N 103°47.0'W
01 AGL B 100 MSL to	L	CIM 101/28	36°18.0'N 104°21.0'W
01 AGL B 90 MSL to	M	CIM 131/43	35°55.0'N 104°21.0'W
01 AGL B 80 MSL to	N	TCC 291/27	35°26.0'N 104°04.0'W
01 AGL B 80 MSL to	O	TCC 278/24	35°19.0'N 104°03.0'W
01 AGL B 70 MSL to	P	TCC 225/24	34°58.0'N 104°00.0'W
01 AGL B 70 MSL to	Q	TCC 196/23	34°50.5'N 103°49.0'W
01 AGL B 70 MSL to	R	TCC 184/33	34°39.0'N 103°47.0'W
Then R-5105/R-5104			
Re-Entry: R-5104/R-5105			
01 AGL B 70 MSL to	R1	CVS 293/28	34°39.0'N 103°47.0'W
01 AGL B 70 MSL to	AA	CVS 230/27	34°10.0'N 103°48.0'W
01 AGL B 70 MSL to	AB	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	AC	CVS 227/44	34°00.0'N 104°04.0'W
01 AGL B 70 MSL to	AD	CVS 283/39	34°39.0'N 104°02.0'W
01 AGL B 70 MSL to	R2	CVS 293/28	34°39.0'N 103°47.0'W
Alternate Entry: J			
As assign at	S	TBE 086/25	37°12.0'N 103°04.5'W
Descend to be at or below 80 MSL at	T	TBE 107/19	37°06.0'N 103°15.0'W
01 AGL B 80 MSL to	J1	TBE 168/20	36°55.0'N 103°36.0'W
Thence via IR-107			
Alternate Entry: M			
As assign to	U	CIM 098/32	36°18.0'N 104°15.0'W
Descend so as to cross at or below 80 MSL	M1	CIM 131/43	35°55.0'N 104°21.0'W
Thence via IR-107			
Alternate Exit: K			
Cross at 100 MSL	K1	TBE 188/26	36°51.5'N 103°47.0'W
Climb so as to be at 110 MSL at	V	TBE 208/35	36°49.0'N 104°04.0'W
Contact Albuquerque ARTCC on 353.8			
Alternate Exit: P			
Cross at 70 MSL	P1	TCC 225/24	34°58.0'N 104°00.0'W
Maintain 70 MSL to	W	TCC 186/14	34°58.0'N 103°41.0'W
Contact Albuquerque ARTCC on 319.2			
Alternate Transition Route to IR-409			
01 AGL B 80 MSL to	II	DHT 323/52	36°53.0'N 103°00.0'W
01 AGL B 80 MSL to	II	TBE 125/24	36°58.0'N 103°16.0'W
Thence via IR-409			

**ROUTE WIDTH** - 7.5 NM either side of centerline entire route to include exits, alternate entries and re-entries.

**Special Operating Procedures:**

- (1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.
- (3) ZAB ARTCC does not provide IFR separation between scheduled MTR users while on this route.
- (4) Avoid by 1500' or 3 NM: All chartered airfields.
- (5) Avoid area bounded by 36°02.0'N 103°59.0'W to 36°02.0'N 103°51.0'W to 35°49.0'N 103°43.0'W to 35°49.0'N 103°50.0'W to the starting point.
- (6) Avoid by 2 NM:
  - (a) Kenton State Park (36°51.0'N 102°53.0'W)
  - (b) Capulin National Monument (36°47.0'N 103°46.0'W)
  - (c) Ranch near Quay, NM (34°55.0'N 103°46.0'W)
  - (d) House, NM (34°39.0'N 103°54.0'W)
- (7) Avoid by 1000' and 1 NM:
  - (a) Ray Ranches (35°55.0'N 104°21.0'W) and (35°54.5'N 104°17.0'W)
  - (b) Jaritas Ranch (36°14.5'N 104°23.5'W)
  - (c) Ranch (35°02.0'N 104°23.5'W)
  - (d) Ranch (35°48.5'N 103°13.8'W)
  - (e) Ranch (34°54.0'N 103°50.0'W)
  - (f) Ranch (36°06.0'N 103°10.5'W)
- (8) Avoid by 1.5 NM and 1000' AGL Bell Ranch Complex (35°34.0'N 104°05.0'W).
- (9) Aircraft using R-5104/R-5105 will file a re-entry on flight plans to ensure airspace reservation on downwind pattern.
- (10) Aircraft not scheduled onto Melrose Range (R-5104/R-5105) must exit at or prior to Pt P.
- (11) Deconfliction between this and other 27 TFW crossing routes will be by 27 TFW scheduling.
- (12) "See and Avoid" applies to non 27 TFW conflicting VR and SR routes.
- (13) Route conflicts with VR-1181, VR-108, VR-1195/1107, VR-1574/1174, IR-409, IR-109, IR-111, and IR-113. Consult Flip AP-18 Chart for particulars.

**FSS's Within 100 NM Radius:**

ABQ, AMA, CNM, GCK, INK, LVS, MAF, ROW, TCC

**TERRAIN FOLLOWING OPERATIONS:** Authorized entire route

**IR-109**

**ORIGINATING ACTIVITY:** 27 TFW/DOR, Cannon AFB, NM 88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU, Cannon AFB, NM 88103-5129 AUTOVON 681-2276, nights/weekends 681-2253.

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
160 MSL or as assign at	A	ABQ 332/65	36°05.0'N 107°10.0'W
01 B 120 MSL to	B	ABQ 344/71	36°14.0'N 106°53.0'W
01 B 120 MSL to	C	ABQ 346/76	36°19.0'N 106°50.0'W
01 B 120 MSL to	D	ALS 190/41	36°43.0'N 106°09.0'W
01 B 120 MSL to	E	ALS 150/22	37°00.0'N 105°41.0'W
01 B 120 MSL to	F	ALS 134/21	37°03.5'N 105°35.0'W
01 B 120 MSL to	AO	ALS 119/26	37°03.5'N 105°24.5'W
01 B 150 MSL to	AP	ALS 119/37	36°56.0'N 105°15.0'W
01 B 150 MSL to	G	CIM 295/17	36°40.0'N 105°09.0'W
01 B 150 MSL to	H	CIM 277/13	36°34.0'N 105°08.0'W
01 B 150 MSL to	I	CIM 221/18	36°19.0'N 105°10.0'W
01 B 150 MSL to	J	CIM 204/25	36°09.0'N 105°11.0'W
01 B 150 MSL to	K	LVS 352/27	36°06.0'N 105°05.0'W
01 B 120 MSL to	L	LVS 043/28	35°55.0'N 104°40.0'W
01 B 120 MSL to	M	LVS 055/29	35°50.0'N 104°35.0'W
01 B 90 MSL to	N	LVS 069/26	35°43.0'N 104°36.0'W
01 B 80 MSL to	O	TCC 263/45	35°15.0'N 104°31.0'W
01 B 70 MSL to	P	TCC 245/44	35°01.0'N 104°28.0'W
01 B 70 MSL to	Q	CVS 281/32	34°35.0'N 103°55.0'W

**Alternate Transition**

Routing to R-5104 IR-109

**South**

As assign to	P1	TCC 245/44	35°01.0'N 104°28.0'W
01 B 70 MSL to	AA	ROW 341/53	34°13.0'N 104°45.0'W
01 AGL B 70 MSL to	AB	ROW 343/47	34°07.0'N 104°42.0'W
01 AGL B 70 MSL to	AC	ROW 008/44	34°02.0'N 104°19.0'W
01 AGL B 70 MSL to	AD	CVS 219/42	33°56.0'N 103°59.0'W
01 AGL B 70 MSL to	AE	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	AF	CVS 230/27	34°10.0'N 103°48.0'W

**to R-5104/R-5105**

North Race Track: Exit

R-5104/R-5105 at or below 70 MSL

01 AGL B 70 MSL to	AF1	CVS 230/27	34°10.0'N 103°48.0'W
01 AGL B 70 MSL to	AE1	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	AG	CVS 227/44	34°00.0'N 104°04.0'W
01 AGL B 70 MSL to	AH	CVS 283/39	34°39.0'N 104°02.0'W
01 AGL B 70 MSL to	AI	TCC 184/33	34°39.0'N 103°47.0'W

**to R-5104/5105**

South Race Track: Exit

R-5104/5105 at or below 70 MSL to

01 AGL B 70 MSL to	AI1	TCC 184/33	34°39.0'N 103°47.0'W
01 AGL B 70 MSL to	AH1	CVS 283/39	34°39.0'N 104°02.0'W
01 AGL B 70 MSL to	AG1	CVS 227/44	34°00.0'N 104°04.0'W
01 AGL B 70 MSL to	AE2	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	AF2	CVS 230/27	34°10.0'N 103°48.0'W

**to R-5104/R-5105****Alternate Entry: I**

160 MSL or as assign at	AJ	CIM 273/21	36°35.0'N 105°17.0'W
01 AGL B 150 MSL to	II	CIM 221/18	36°19.0'N 105°10.0'W

Then via IR-109

**Alternate Entry: M**

170 MSL or as assign at	AN	LVS 035/40	36°06.0'N 104°32.0'W
Descend to cross	M1	LVS 055/29	35°50.0'N 104°35.0'W

at 01 AGL B 90 MSL then

via IR-109 or IR-109

**South****Alternate Exit: J**

150 MSL or	J1	CIM 204/25	36°09.0'N 105°11.0'W
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Proceed direct to	AK	LVS 341/16	35°55.0'N 105°10.0'W
(Contact Albuquerque ARTCC on 353.8)			
Alternate Exit: AO			
01 B 120 MSL to	AO1	ALS 119/26	37°03.5'N 105°24.5'W
(Contact Denver ARTCC on 343.7)			
Climb to Cross	AR	ALS 083/24	37°18.4'N 105°19.4'W
at 160 MSL			
Alternate Exit: P			
70 MSL or below at	P2	TCC 245/44	35°01.0'N 104°28.0'W
70 MSL to	AL	TCC 247/29	35°05.0'N 104°11.0'W
Flight plan route			
Alternate Exit: AE			
01 AGL B 70 MSL at	AE3	CVS 216/34	34°00.0'N 103°50.0'W
70 MSL to	AM	CVS 193/21	34°04.0'N 103°30.0'W
Contact Cannon RAPCON on 358.3 leaving 61 MSL			
Alternate Exit: AQ			
70 MSL or below at	P1	TCC 245/44	35°01.0'N 104°28.0'W
Climb to cross	AQ	ROW 348/76	34°36.0'N 104°37.0'W
at 70 MSL or assign			
(Contact ZAB ARTCC on 319.2 for transition to VR-1195 or Pecos MOAS).			

**TERRAIN FOLLOWING OPERATIONS:** Authorized entire route.

**ROUTE WIDTH** - 5 NM either side of centerline from A to E; 3 NM left and 1 NM right of centerline from E to AO; 5 NM left and 3 NM right of centerline from AO to AP; 5 NM either side of centerline from AP to end of route; 5 NM either side of centerline for Alternate Entry I and Exits J, P, and AE; 4 NM either side of centerline for Alternate Entry M. Alternate Exit AO: 3 NM left and 1 NM right of centerline from F to AO, 4 NM either side of centerline from AO to AR, Re-Entry: R-5104/5105; 7.5 NM either side of centerline on Re-Entry pattern AF1 to AI, A11 and AF2.

**Special Operating Procedures:**

- (1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes apart. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in-the-blind route entry and exit On 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.
- (3) ZAB ARTCC does not provide IFR separation between scheduled MTR users while on this route.
- (4) Avoid all charted public use airfields by 1500' AGL or 3 NM.
- (5) Points C through G are noise sensitive.
- (6) Avoid by 2 NM:
  - (a) Guadalupe, NM (36°38.0'N 105°14.0'W)
  - (b) Ocate and Narojos, NM area (36°10.0'N 105°00.0'W)
  - (c) House, NM (34°39.0'N 103°54.0'W)
- (7) Avoid by 1000' AGL or 1 NM on area bounded by 34°20.0'N 104°46.0'W to 34°21.0'N 104°43.0'W to 34°13.0'N 104°12.0'W to beginning.
- (8) Aircraft transitioning to south routing to R-5104 will file "TCC 245/44 IR1095" after main routing.
- (9) Aircraft may exit at point AQ for transition to VR-1195/1107 or Pecos MOAs. Contact ABQ ARTCC at point AQ.
- (10) Aircraft using R-5104/R-5105 will file a re-entry on all flight plans to ensure airspace reservation on downwind pattern. R-5104/R-5105 re-entry pattern conflicts with Pecos low MOAs.
- (11) Aircraft not scheduled into R-5104/5105 must exit at or prior to point P or point AE south transition.
- (12) Deconfliction between this and other crossing 27 TFW routes will be by 27 TFW Scheduling. "See and Avoid" applies to non-27 TFW conflicting VR and SR routes.
- (13) Route conflicts with Pecos Low MOA, IR-107, IR-110, IR-111, IR-113, VR-1195/1107, VR-108, VR-125, VR-1174/1574 and VR-1181. Consult Flip AP/18 chart for particulars.

**FSS's Within 100 NM Radius:**

ABQ, AMA, CNM, GUP, INK, LVS, MAF, ROW, TCC, TCS



# IR-111

**ORIGINATING ACTIVITY:** 27 TFW/DOR, Cannon AFB, NM 88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU, Cannon AFB, NM 88103-5129 AUTOVON 681-2276, nights/weekends 681-2253.

**HOURS OF OPERATION:** Continuous.

## ROUTE DESCRIPTION:

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assign to	A	ACH 222/31	34°48.5'N 105°23.0'W
01 AGL B 90 MSL to	B	LVS 226/24	35°27.0'N 105°33.0'W
01 AGL B 120 MSL to	C	LVS 261/20	35°41.0'N 105°33.0'W
01 AGL B 160 MSL to	D	LVS 275/21	35°46.0'N 105°33.0'W
01 AGL B 160 MSL to	E	LVS 314/37	36°11.0'N 105°33.0'W
01 AGL B 160 MSL to	F	LVS 326/38	36°15.0'N 105°25.0'W
01 AGL B 160 MSL to	G	LVS 332/35	36°13.0'N 105°19.0'W
01 AGL B 160 MSL to	H	LVS 352/27	36°06.0'N 105°05.0'W
01 AGL B 120 MSL to	I	LVS 043/28	35°55.0'N 104°40.0'W
01 AGL B 120 MSL to	J	LVS 055/29	35°50.0'N 104°35.0'W
01 AGL B 90 MSL to	K	LVS 094/26	35°32.0'N 104°38.0'W
01 AGL B 90 MSL to	L	LVS 110/24	35°26.0'N 104°43.0'W
01 AGL B 90 MSL to	M	ACH 291/13	35°14.0'N 105°16.0'W
01 AGL B 90 MSL to	N	ACH 264/13	35°08.0'N 105°18.0'W
01 AGL B 90 MSL to	O	ACH 163/22	34°45.0'N 105°00.0'W
Alternate Exit: Point O			
Climb to cross	O1	ACH 163/22	34°45.0'N 105°00.0'W
at 90 MSL			
Turn right to a heading			
of 270 to	AB	ACH 175/32	34°35.0'N 105°07.0'W
Maint 90 MSL or as			
assigned. (Ctc ZAB			
ARTCC on 269.4 for			
tran to VR-1195 or			
Pecos MOA)			
01 AGL B 80 MSL to	P	ACH 151/26	34°42.0'N 104°53.0'W
01 AGL B 70 MSL to	Q	TCC 211/24	34°53.0'N 103°56.0'W
01 AGL B 70 MSL to	R	TCC 190/25	34°48.0'N 103°47.0'W
01 AGL B 70 MSL to	S	TCC 184/33	34°39.0'N 103°47.0'W
To R-5105			
Re-Entry-Exit			
R-5104/R-5105			
01 AGL B 70 MSL to	S1	CVS 293/28	34°39.0'N 103°47.0'W
01 AGL B 70 MSL to	T	CVS 230/27	34°10.0'N 103°48.0'W
01 AGL B 70 MSL to	U	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	V	CVS 227/44	34°00.0'N 104°04.0'W
01 AGL B 70 MSL to	W	CVS 283/39	34°39.0'N 104°02.0'W
01 AGL B 70 MSL to	S2	TCC 184/33	34°39.0'N 103°47.0'W
Alternate Entry: Point J			
As assign at	Y	LVS 035/40	36°06.0'N 104°32.0'W
Descend to cross	J1	LVS 055/29	35°50.0'N 104°35.0'W
at 01 AGL B 90 MSL			
Alternate Entry: Point R			
As assign at	Z	TCC 268/18	35°14.0'N 103°58.0'W
Descend to	R1	TCC 190/25	34°48.0'N 103°47.0'W
at 01 AGL B 70 MSL			
Alternate Exit: Point Q			
01 AGL B 70 MSL to	Q1	TCC 211/24	34°53.0'N 103°56.0'W
Climb to			
120 MSL or as assign to	AA	TCC 147/14	34°58.0'N 103°30.0'W
Contact Albuquerque ARTCC on (319.2).			
Alternate Transition to			
Pecos East and West Low MOA			
01 AGL B 90 MSL to	O2	ACH 163/22	34°45.0'N 105°00.0'W
01 AGL B 80 MSL to	AC	ACH 158/34	34°33.0'N 104°55.0'W
Pecos East and West			
Low MOA to	AD	TCC 199/43	34°34.0'N 104°02.5'W
01 AGL B 70 MSL to	Q2	TCC 211/24	34°33.0'N 103°56.0'W
Thence via IR-111			

**TERRAIN FOLLOWING OPERATIONS:** Authorized for entire route.

**ROUTE WIDTH** - 4 NM either side of centerline from A to K; 6 NM either side of centerline from K to S;

Re-Entry-Exit R-5104/R-5105;

7.5 NM either side of centerline on re-entry pattern S1 to S2; 4 NM either side of centerline on all Alternate Entries and Exits; 4 NM right and 22 NM left of centerline O2 to AC and AD to Q2.

## Special Operating Procedures:

(1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.

(2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational constraints dictate otherwise.

(3) ZAB ARTCC does not provide IFR separation between scheduled MTR users while on this route.

(4) Avoid by 2 NM:

- (a) Guadalupe, NM (36°38.0'N 105°14.0'W)
- (b) Ocate and Narvajo, NM area (36°10.0'N 105°00.0'W)
- (c) Ranch near Quay, NM (34°55.0'N 103°46.0'W)
- (d) House, NM (34°39.0'N 103°46.0'W)

(5) Avoid by 1000' and 1 NM:

- (a) Ranch (35°56.5'N 104°38.5'W)
- (b) Ranch (34°53.0'N 104°23.0'W)
- (c) Ranch (35°18.0'N 105°07.0'W)
- (d) Ranch (35°05.0'N 105°09.5'W)
- (e) Ranch (34°54.0'N 103°50.0'W)
- (f) Ranch (34°50.5'N 103°59.3'W)
- (g) Truck stop (34°59.0'N 105°13.5'W)

(6) Avoid by 1.5 NM, ranch (35°27.0'N 105°35.0'W) and South San Ysidro (35°27.0'N 105°35.0'W).

(7) Avoid Pasture, NM (34°47.0'N 104°57.0'W) by 1.5 NM and 1000'.

(8) Remain above 1000' AGL 3 NM either side of I-25 near Point B.

(9) Aircraft using R-5104/R-5105 will file a re-entry on all flight plans to ensure airspace reservation on downwind pattern.

(10) Deconfliction between this and other crossing 27 TFW routes will be by 27 TFW scheduling. "See and Avoid" applies to conflicting non 27 TFW VR and SR routes.

(11) Route conflicts with IR-109, IR-110, IR-113, IR-107, VR-108, VR-1195/1107, VR-1574/1174, and VR-1181. Consult Flip AP/1B Chart for particulars.

(12) Pecos East and West Low MOA transition may be filed only if scheduled into Pecos East and West Low MOA. Aircraft must receive clearance from ZAB ARTCC into Pecos East and West Low MOA prior to route entry. Flight plans must specify the required delay in Pecos East and West Low MOA. Monitor assigned frequency in MOA airspace. Transition is for 27 TFW use only.

IR-112 100400Z JUN 96 MMW, EW 000 000000

**ORIGINATING ACTIVITY: 27 TFW, Cannon AFB, NM 88103-5129  
AUTOVON 681-2877.**

**SCHEDULING ACTIVITY: 27 TFW, Cannon AFB, NM 88103-5129  
AUTOVON 681-2276, nights/weekends 681-2253**

**Hours of Operation:** Continuous

## ROUTE DESCRIPTION.

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
FL 200 or as assign to Descend to	ABQ	305/33	35°27.1'N 107°15.0'W
SFC B 100 MSL to	A	ABQ 293/50	35°32.0'N 107°39.0'W
SFC B 100 MSL to	B	GUP 071/43	35°32.0'N 108°00.0'W
SFC B 100 MSL to	C	GUP 069/41	35°33.0'N 108°03.0'W
SFC B 100 MSL to	D	GUP 316/26	35°51.0'N 109°08.0'W
SFC B 100 MSL to	E	GUP 278/46	35°46.0'N 109°45.0'W
SFC B 100 MSL to	F	GUP 279/55	35°50.0'N 109°54.0'W
SFC B 90 MSL to	G	TBC 070/58	36°12.0'N 110°05.0'W
SFC B 90 MSL to	H	TBC 065/49	36°16.0'N 110°16.0'W
SFC B 90 MSL to	I	TBC 073/20	36°08.0'N 110°52.0'W
SFC B 90 MSL to	J	TBC 087/16	36°04.0'N 110°56.5'W
SFC B 90 MSL to	K	INW 288/23	35°16.0'N 111°12.0'W
SFC B 80 MSL to	L	INW 215/21	34°50.0'N 111°07.0'W
SFC B 80 MSL to	M	INW 190/19	34°46.0'N 110°57.0'W
SFC B 80 MSL to	N	SJN 293/47	34°52.0'N 109°55.0'W
After N turn right and climb to cross	O	SJN 300/34	34°48.0'N 109°39.0'W
at 110 MSL (Maintain 110 MSL and contact)			
Albuquerque ARTCC on 307.2 for higher altitude			
As assign to	P	SJN 284/20	34°34.0'N 109°30.0'W
As assign to	Q	SJN 198/0	34°25.4'N 109°08.6'W
Re-Entry: Exit Bomb Run Corridor			
SFC B 80 MSL	N1	SJN 293/47	34°52.0'N 109°55.0'W
Turn right at SFC B 80 MSL to	AA	SJN 292/39	34°47.0'N 109°48.0'W
Continue right turn at SFC B 80 MSL to	AB	SJN 281/41	34°41.0'N 109°54.0'W
Climb to cross	AC	INW 179/30	34°34.0'N 110°56.0'W
At or below 100 MSL turn right at or below 100 MSL to	AD	INW 194/27	34°40.0'N 111°03.0'W
Descend to cross	MI	INW 190/19	34°46.0'N 110°57.0'W
at or below 80 MSL			
Alternate Entry: H			
Cross	H1	TBC 065/49	36°16.0'N 110°16.0'W
at 170 MSL or as assign	II	TBC 073/20	36°08.0'N 110°52.0'W
Descend to cross	K1	INW 288/23	35°16.0'N 111°12.0'W
at or below 90 MSL	L1	INW 215/21	34°50.0'N 111°07.0'W
Alternate Entry: K			
Cross			
at 170 MSL or as assign	12	TBC 073/20	36°08.0'N 110°52.0'W
Descend to cross	X	TBC 041/14	36°15.0'N 111°02.0'W
at or below 80 MSL			
Alternate Exit: I			
SFC B 90 MSL to			
Climb to cross			
at 110 MSL or as assign	L2	INW 213/21	34°50.0'N 111°02.0'W
Contact Denver ARTCC on 343.7 for further clearance)			
Alternate Exit: L			
SFC B 80 MSL to			

Clouds to cross M2 INW 190/19 34°46.0'N 130°57.0'W  
at 110 MSL or as asnd  
Beneath Albuquerque ← S. YUTIN/TOA 2018 AMERICO  
ARTCC on 298.9  
Over L for further  
Balloons 90°W 41°N 14000ft M2 INW 190/19 S. YUTIN/TOA 2018 AMERICO

**TERRAIN FOLLOWING OPERATIONS: Authorized entire route.**

**ROUTE WIDTH** - 5 NM either side of centerline from A to D; 5 NM left and 4 NM right of centerline from D to E; 5 NM either side of centerline from E to N; 5 NM either side of centerline for Alternate Exit I. Re-Entry: Exit before run corridor; 5 NM either side of centerline between N1 and M1.

### **Special Operating Procedures:**

**Section 2: Planning, Preparation**  
**(1) Nach 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 km ground speed.**

(2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.

(3) ZAB ARTCC does not provide IFR separation between scheduled MTR users while on this route.

(4) Avoid all charted airports by 1500' or 3 NM.

(5) Avoid by 1000' or 1 NM:

(10) Building (34°49.2'N 109°52.0'W)

**(b) Indian Village (35°43.5'N 108°46.0'W)**

(6) CAUTION: Numerous powerlines cross route. —  
(7) STR éve will be deconflicted through 27 TFW scheduling and HQ SAC.  
Aircraft without a scheduled STR time will exit at Point L. Cross Point M  
at 1500' AGL to ensure STR tracking.

(8) This route conflicts with IR-276 between Points D and E. Aircraft not flown on Automatic Terrain following (TFR) or in VMC must be at 10,000' MSL between these points.

Met between these points.

(9) "See and Avoid" applies to conflicting non 27 TFW VR and SR routes.

(10) Route conflicts with IR-276, VR-225 and VR-1200. Consult Flip AR/IR Chart for particulars.

#### **FSS's Within 100 NM Radius:**

**IR-113**

**ORIGINATING ACTIVITY:** 27 TFW/DOR Cannon AFB, NM  
88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU Cannon AFB, NM  
88103-5129 AUTOVON 681-2776 nights/weekends 681-2253.

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assigned to	A	TCC 226/24	34°58.0'N 104°00.9'W
Descend to 80 MSL or below to	B	TCC 217/38	34°46.0'N 104°11.0'W
01 AGL B 80 MSL to	C	CNX 074/57	34°25.0'N 104°32.0'W
01 AGL B 80 MSL to	D	CNX 076/51	34°23.0'N 104°39.0'W
01 AGL B 80 MSL to	E	CNX 059/20	34°28.0'N 105°18.0'W
01 AGL B 90 MSL to	F	CNX 353/12	34°34.0'N 105°39.0'W
01 AGL B 90 MSL to	G	CNX 307/21	34°38.0'N 105°57.0'W
01 AGL B 90 MSL to	H	CNX 280/23	34°31.0'N 106°06.0'W
01 AGL B 90 MSL to	I	CNX 241/16	34°17.5'N 105°59.5'W
01 AGL B 115 MSL to	J	CNX 176/35	33°47.5'N 105°47.5'W
01 AGL B 115 MSL to	K	CNX 167/38	33°43.5'N 105°40.5'W
01 AGL B 115 MSL to	L	CNX 143/44	33°41.5'N 105°19.5'W
Start descent so as to cross	M	ROW 302/39	33°47.5'N 105°11.5'W
at or below 80 MSL			
01 AGL B 80 MSL to	N	ROW 319/46	34°00.5'N 105°04.5'W
01 AGL B 80 MSL to	O	ROW 329/46	34°03.5'N 104°55.5'W
01 AGL B 80 MSL to	OO	CVS 231/50	33°58.0'N 104°12.0'W
01 AGL B 70 MSL to	P	CVS 222/42	33°56.5'N 103°59.5'W
01 AGL B 70 MSL to	Q	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	R	CVS 230/27	34°10.0'N 103°48.0'W
Alternate Transition			
Route to Oscuro Range on IR-133			
01 AGL B 90 MSL to	F1	CNX 353/12	34°34.0'N 105°39.0'W
01 AGL B 90 MSL to	AA	CNX 304/23	34°39.0'N 106°00.0'W
01 AGL B 90 MSL to	AB	CNX 234/17	34°15.5'N 105°59.5'W
01 AGL B 110 MSL to	AC	CNX 190/42	33°43.0'N 106°00.0'W
Alternate Transition to			
Pecos South Low MOA			
01 AGL B 80 MSL to	O1	ROW 329/46	34°03.5'N 104°55.5'W
Pecos South Low MOA			
As assigned by ZAB to	P1	CVS 222/42	33°56.5'N 103°59.5'W
Alternate Transition			
Route to Red Rio Range on IR-133			
01 AGL B 90 MSL to	F2	CNX 353/12	34°34.0'N 105°39.0'W
01 AGL B 90 MSL to	BA	OMN 080/22	34°19.0'N 106°23.0'W
01 AGL B 90 MSL to	BB	OMN 125/42	33°49.0'N 106°16.0'W
Re-Entry: Exit R-5105/R-5104			
Turn left direct to Q			
01 AGL B 70 MSL to	S	TCC 184/33	34°39.0'N 103°47.0'W
01 AGL B 70 MSL to	T	CVS 283/39	34°39.0'N 104°02.0'W
01 AGL B 70 MSL to	U	CVS 227/44	34°00.0'N 104°04.0'W
01 AGL B 70 MSL to	Q1	CVS 216/34	34°00.0'N 103°50.0'W
01 AGL B 70 MSL to	R1	CVS 230/27	34°10.0'N 103°48.0'W
Alternate Entry: E1			
As assigned at	CA	CNX 052/40	34°39.2'N 104°56.7'W
Descend to cross	E1	CNX 059/20	34°28.0'N 105°18.0'W
at or below 80 MSL			
Then via IR-113.			
Alternate Entry: K1			
Exit R-5107 at 110			
MSL	CB	CNX 194/43	33°44.0'N 106°04.2'W
At 110 MSL to	K1	CNX 167/38	33°43.5'N 105°40.5'W
Then via IR-113			
Alternate Entry: Q2			
As assigned at	CC	ROW 057/41	33°34.8'N 103°51.4'W
Descend to cross	Q2	CVS 216/34	34°00.0'N 103°50.0'W
at or below 70 MSL			
Then via IR-113.			

**Alternate Exit:**

01 AGL B 80 MSL to	O2	CVS 321/50	33°58.0'N 104°12.0'W
70 MSL or as assigned to	P2	CVS 222/42	33°56.5'N 103°59.5'W
(Contact ZAB ARTCC on 319.2 or Cannon Rapcon on 358.3)			

**TERRAIN FOLLOWING OPERATIONS:** Authorized entire route.

**ROUTE WIDTH** - 5 NM either side of centerline from A to C; 4 NM either side of centerline from C to D; 5 NM either side of centerline from D to R; 5 NM either side of centerline for all Alternate Entries and Exits. Re-entry: R-5104/R-5105 7.5 NM either side of centerline on Re-entry Pattern S to R1.

**Special Operating Procedures:**

- (1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an alternate entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.
- (3) ZAB ARTCC does not provide IFR separation between scheduled MTR users while on this route.
- (4) Avoid by 3 NM: Gran Quivira National Monument (34°16.0'N 106°06.0'W).
- (5) Avoid by 1500' and 3 NM: All charted airfields.
- (6) Avoid area bounded by 34°31.0'N 104°28.0'W to 34°31.0'N 104°20.0'W to 34°20.0'N 104°28.5'W.
- (7) Avoid by 2 NM:
  - (A) Ranch (33°42.5'N 105°38.0'W)
  - (B) Duran, NM (34°28.0'N 104°54.0'W)
  - (C) Lake Summer Recreational Area (34°37.0'N 104°24.0'W)
  - (D) Willard, NM (34°36.0'N 106°02.0'W)
  - (E) Vaughn, NM (34°36.0'N 105°12.5'W).
- (8) Avoid by 1000' and 1 NM:
  - (A) Ranch (34°36.0'N 104°18.0'W)
  - (B) Ranch (33°56.5'N 105°46.5'W)
  - (C) Ranch (34°32.0'N 105°21.0'W)
  - (D) Claunch, NM (34°08.5'N 105°59.5'W)
  - (E) Ranch (33°54'N 105°50.0'W)
  - (F) Ranch (33°42.5'N 105°37.4'W)
- (9) Non 27 TFW users maintain 1000' AGL from Pt J to Pt L.
- (10) CAUTION: Heavy concentration of wild fowl 15 NM SW of Pt P, Oct-Apr.
- (11) Contact Cherokee Control prior to entering R-5107.
- (12) Aircraft using R-5104/R-5105 will file a re-entry on all flight plans to ensure airspace reservation on downwind pattern.
- (13) Pecos South Low MOA transition may be filed only if scheduled into Pecos South Low MOA. Aircraft must receive clearance from ZAB ARTCC into Pecos South Low MOA prior to route entry. Flight plans must specify the required delay in Pecos South Low MOA. Monitor assigned ARTCC frequency while in MOA airspace. Transition is for 27 TFW use only.
- (14) Aircraft not scheduled into R-5104/R-5105 (Melrose Range Complex) must exit prior to Pt 'Q'.
- (15) Deconfliction between this and crossing IR Routes is by 27 TFW scheduling.
- (16) 'See and Avoid' applies to non 27 TFW conflicting VR and SR routes.
- (17) Route conflicts with Pecos Low MOA, IR-109, IR-111, IR-133, VR-1195/1107, VR-108, VR-176 and VR-1181. Consult Flip AP/1B chart for particulars.
- (18) Route is designed for MARSA operations established by coordinated scheduling between 27 TFW and 49 TFW.

**FSS's Within 100 NM Radius:**

ABQ, AMA, CNM, DMN, ELP, GUP, INK, LVS, MAF, ROW, TCC, TCS

## VR-100

**ORIGINATING ACTIVITY:** 27 TFW/DOR, Cannon AFB, NM 88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU, Cannon AFB, NM 88103-5129 AUTOVON 681-2276 ngt 681-2253 weekends.

**HOURS OF OPERATION:** Continuous.

### ROUTE DESCRIPTION:

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assigned to	A	CVS 232/27	34°10.0'N 103°48.0'W
SFC B 110 to	B	ROW 042/49	33°49.0'N 103°49.0'W
SFC B 110 to	C	ROW 056/43	33°36.0'N 103°50.0'W
SFC B 110 to	D	ROW 057/33	33°32.0'N 104°00.0'W
SFC B 110 to	E	ROW 344/34	33°54.0'N 104°40.0'W
SFC B 110 to	F	ROW 333/34	33°53.0'N 104°48.0'W
SFC B 110 to	G	ROW 292/32	33°38.0'N 105°09.0'W
SFC B 125 to	H	CNX 143/44	33°41.5'N 105°19.5'W
SFC B 125 to	I	CNX 167/38	33°43.5'N 105°40.5'W
SFC B 125 to	J	CNX 176/35	33°47.5'N 105°47.5'W
SFC B 110 to	K	CNX 241/16	34°17.5'N 105°59.5'W
SFC B 110 to	L	CNX 280/23	34°31.0'N 106°06.0'W
SFC B 110 to	M	CNX 307/21	34°38.0'N 105°57.0'W
SFC B 110 to	N	CNX 332/14	34°35.5'N 105°45.0'W
SFC B 110 to	O	CNX 012/21	34°41.0'N 105°30.0'W
SFC B 110 to	P	TCC 196/34	34°41.0'N 103°55.0'W
SFC B 110 to	Q	CVS 307/25	34°41.0'N 103°40.0'W

**TERRAIN FOLLOWING OPERATIONS:** Authorized entire route.

**ROUTE WIDTH** - 3 NM left and 5 NM right of centerline from A to B; 1.5 NM either side of centerline from B to F; 5 NM either side of centerline from F to N; 5 NM increasing to 28 NM either side of centerline from N to O; 28 NM either side of centerline from O to P; 28 NM left and 2 NM right of centerline from P to Q.

### Special Operating Procedures:

- (1) Non-27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time, enter at an alternate entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in the blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.
- (3) Alternate Entry: B through P.
- (4) Alternate Exit: C through P.
- (5) When practicable, avoid all uncontrolled airfields by 1500' AGL or 3 NM.
- (6) Non-27 TFW aircraft maintain 1000' AGL min altitude between points G and J.
- (7) Avoid Gran Guijaro National Monument 34°15.0'N 106°06.0'W by 3 NM.
- (8) Avoid ranch at 34°55.0'N 103°46.0'W by 1000' AGL or 3 NM.
- (9) Avoid by 2 NM:
  - (a) Ranch 34°21.0'N 104°22.0'W
  - (b) Ranch 34°15.0'N 104°30.0'W
  - (c) Ranch 34°18.0'N 104°25.0'W
- (10) Avoid Ranch at 34°21.0'N 104°33.0'W by 2 NM or 1000' AGL.
- (11) Avoid White Oaks, NM 34°45.0'N 105°44.0'W by 1.5 NM or 1000' AGL.
- (12) Avoid by 1000' AGL or 1 NM:
  - (a) Ranch 34°54.0'N 103°50.0'W
  - (b) Ranch 34°22.0'N 104°05.0'W
  - (c) Ranch 34°50.0'N 103°59.0'W
  - (d) Ranch 34°17.0'N 105°05.0'W
- (e) Area 1 NM either side of a line from 34°21.0'N 104°44.0'W to 34°13.0'N 104°41.0'W.

(13) Aircraft not scheduled into R-5104/R-5105 must exit at or prior to Point P.

(14) Deconfliction is by 27 TFW Scheduling.

(15) Route conflicts with IR-109, IR-113, IR-128, IR-133, IR-180, VR-176, and VR-1195/1107. Consult FLIP AP/1B chart for particulars.

(16) Uncharted/unchumed obstructions as of 1 July 87.

(a) Towers at:

- 34°59.5'N 104°08.0'W (200')
- 34°57.3'N 105°12.7'W (295')
- 33°50.0'N 103°45.0'W (125')
- 33°51.5'N 103°46.0'W (100')
- 33°56.0'N 103°53.0'W (200')
- 34°09.0'N 105°04.8'W (125')
- 35°03.8'N 104°02.2'W (150')
- 34°50.5'N 103°44.2'W (200')
- 34°18.8'N 105°46.8'W (200')
- 35°07.3'N 105°35.4'W (125')

(b) Powerline (100') from 34°24.0'N 103°35.0'W to 34°24.0'N 103°40.5'W to 34°27.5'N 103°40.5'W to 34°27.5'N 103°48.5'W to 34°28.5'N 103°51.5'W to 34°28.5'N 103°55.0'W to 34°37.5'N 104°05.0'W to 34°57.5'N 104°37.0'W to 35°01.0'N 104°55.0'W to 35°06.5'N 104°58.0'W to 35°03.5'N 105°12.5'W to 35°05.0'N 105°37.0'W.

### FSS's Within 100 NM Radius:

ABQ, AMA, CNM, DMN, ELP, GUP, INK, LVS, MAF, ROW, TCC, TCS

**VR-108**

**ORIGINATING ACTIVITY:** 27 TFW/DOR Cannon AFB, NM 88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU Cannon AFB, NM 88103-5129 AUTOVON 681-2276 and nights/weekends 681-2253.

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assigned to	A	DHT 276/58	36°23.0'N 103°41.0'W
01 AGL B 120 MSL	B	DHT 283/59	36°30.0'N 103°39.0'W
01 AGL B 120 MSL	C	DHT 292/56	36°37.0'N 103°30.0'W
01 AGL B 80 MSL	D	DHT 318/44	36°44.0'N 103°00.0'W
01 AGL B 80 MSL	E	TBE 116/37	36°53.0'N 103°00.0'W
01 AGL B 80 MSL	F	TBE 156/19	36°57.0'N 103°31.0'W
01 AGL B 150 MSL	G	TBE 190/25	36°52.0'N 103°48.0'W
01 AGL B 150 MSL	H	TBE 196/28	36°51.0'N 103°52.0'W
01 AGL B 150 MSL	I	TBE 189/50	36°29.0'N 103°58.0'W
01 AGL B 130 MSL	J	TCC 330/62	36°10.0'N 103°59.0'W
01 AGL B 80 MSL	K	TCC 332/36	35°46.0'N 103°48.0'W
01 AGL B 80 MSL	L	TCC 330/33	35°42.0'N 103°48.0'W
01 AGL B 80 MSL	M	TCC 264/24	35°13.5'N 104°05.0'W
01 AGL B 70 MSL	N	TCC 249/22	35°07.5'N 104°02.0'W
01 AGL B 70 MSL	O	TCC 190/24	34°48.5'N 103°47.0'W
01 AGL B 70 MSL	P	TCC 184/33	34°39.0'N 103°47.0'W

**TERRAIN FOLLOWING OPERATIONS:** Terrain following operations authorized entire route.

**ROUTE WIDTH** - 5 NM either side of centerline from A to I; 7.5 NM either side of centerline from I to J; 7.5 NM left and 20 NM right of centerline from J to P.

**Special Operating Procedures:**

- (1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked Entry and Exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational constraints dictate otherwise.
- (3) Avoid overflight of Mosquero, NM (35°47.0'N 103°58.0'W) by 1 NM.
- (4) Avoid area bounded by 36°03.0'N 103°55.0'W to 36°00.0'N 103°50.0'W to 35°48.0'N 103°45.0'W to 35°47.0'N 103°51.0'W to the starting point.
- (5) Avoid the following by 2 NM:
  - (a) Capulin National Monument (36°47.0'N 103°48.0'W)
  - (b) Bell Ranch (35°32.0'N 104°06.0'W)
  - (c) Ranch (35°02.0'N 104°04.0'W)
  - (d) Quay, NM (34°55.0'N 103°46.0'W)
  - (e) House, NM (34°39.0'N 103°54.0'W)
  - (f) Kenton State Park (36°51.0'N 102°53.0'W)
  - (g) Ranch (34°50.5'N 103°59.2'W)
  - (h) Ranch (34°54.0'N 103°50.0'W)
- (6) Avoid all charted airports by 3 NM/1500' AGL.
- (7) Alternate Entry: B thru P.
- (8) Alternate Exit: D thru N.
- (9) Deconfliction between this and other crossing 27 TFW routes will be by 27 TFW scheduling. "See and Avoid" applies to all other crossing routes.
- (10) Route conflicts with IR-107, IR-109, IR-111, VR-1174/1574, VR-1195/1107, and VR-1181. Consult Flip AP/1B chart for particulars.
- (11) Aircraft not scheduled into (R-5104/R-5105) must exit at or prior to N.

**FSS's Within 100 NM Radius:**

ABQ, AMA, CNM, GCK, LVS, ROW, TCC

**VR-114**

**ORIGINATING ACTIVITY:** 27 TFW/DOO Cannon AFB, NM 88103  
AUTOVON 681-2276.

**SCHEDULING ACTIVITY:** 27 TFW/DOO Cannon AFB, NM 88103  
AUTOVON 681-2276; Night/weekend 681-2253.

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assigned to	A	TCC 121/47	34°38.5'N 102°54.0'W
01 AGL B 110 MSL to	B	TCC 033/44	35°42.0'N 102°58.0'W
01 AGL B 110 MSL to	C	TCC 344/24	35°35.0'N 103°38.0'W
01 AGL B 110 MSL to	D	TCC 309/27	35°32.0'N 103°56.5'W
01 AGL B 110 MSL to	E	TCC 239/23	35°03.5'N 104°02.5'W
01 AGL B 110 MSL to	F	TCC 186/23	34°49.5'N 103°44.5'W
01 AGL B 110 MSL to	G	TCC 184/33	34°39.0'N 103°47.0'W

**TERRAIN FOLLOWING OPERATIONS:** Authorized entire route.

**ROUTE WIDTH** - 20 NM either side of centerline from A to B; 10 NM left and 20 NM right of centerline from B to G.

**Special Operating Procedures:**

- (1) Non-27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked entry and exit times plus or minus 5 minutes. If unable to meet planned entry time, enter at an alternate entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 knots ground speed.
- (2) Aircraft must call in the blind route entry and exit on 255.4. Monitor 255.4 while on this route unless operational requirements dictate otherwise.
- (3) Alternate Entry: B, C, D and E.
- (4) Alternate Exit: B, C, D, E and F.

(5) When practicable, avoid all uncontrolled airfields by 1500' AGL or 3 NM.

(6) Avoid overflight of Mosquero, NM (35°47.0'N 103°58.0'W) by 1 NM.

(7) Avoid by 2 NM:

- (A) Quay, NM 34°55.0'N 103°46.0'W
- (B) House, NM 34°39.0'N 103°54.0'W

(8) Avoid by 1000' AGL or 1 NM:

- (A) Ranch 34°54.0'N 103°50.0'W
- (B) Ranch 35°48.0'N 103°14.0'W

(9) Aircraft not scheduled into R-5104/R-5105 must exit at or prior to point E.

(10) Deconfliction between this and other crossing 27 TFW routes will be by 27 TFW scheduling. See and avoid applies to other conflicting routes.

(11) Route conflicts with IR-107, IR-109, IR-111, IR-113, VR-108, and VR-125. Consult FLIP AP/1B chart for particulars.

(12) Uncharted/uncharted obstructions as of 1 July 87.

(A) Towers at:

- 35°03.8'N 104°02.2'W (150')
- 35°05.0'N 102°57.0'W (150')
- 35°06.3'N 102°57.3'W (150')
- 35°15.0'N 102°47.0'W (300'/250'/250')
- 35°28.0'N 103°11.5'W (125')
- 35°22.0'N 103°24.5'W (200')
- 35°23.5'N 103°23.5'W (125')
- 35°51.0'N 103°17.5'W (175')
- 35°50.0'N 103°25.0'W (100')
- 35°36.1'N 103°32.3'W (515')
- 34°59.5'N 104°08.0'W (200')
- 34°51.1'N 104°07.7'W (200')
- 34°50.5'N 103°44.2'W (200')
- 34°30.5'N 104°00.5'W (329')

(B) Powerline (100') 2 NM north of Highway 60-84 (10 NM north of Melrose Range) and from 34°28.5'N 103°55.0'W to 34°37.5'N 104°05.0'W to 34°57.5'N 104°37.0'W.

(C) Powerline (100') from 35°51.0'N 103°18.0'W to 36°04.0'N 103°25.0'W.

**FSS's Within 100 NM Radius:**

ABQ, TCC, LVS, ROW, AMA, CNM

**VR-125**

**ORIGINATING ACTIVITY:** 27 TFW/DOR Cannon AFB, NM  
88103-5129 AUTOVON 681-2877.

**SCHEDULING ACTIVITY:** 27 TFW/DOTU Cannon AFB, NM  
88103-5129 AUTOVON 681-2276 and nights/weekends 681-2253

**HOURS OF OPERATION:** Continuous.

**ROUTE DESCRIPTION:**

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assign to	A	CVS 307/25	34°41.0'N 103°40.0'W
SFC B 110 to	B	TCC 196/34	34°41.0'N 103°55.0'W
SFC B 110 to	C	CNX 012/21	34°41.0'N 105°30.0'W
SFC B 110 to	D	CNX 332/14	34°35.5'N 105°45.0'W
SFC B 110 to	E	CNX 307/21	34°38.0'N 105°57.0'W
SFC B 110 to	F	CNX 280/23	34°31.0'N 106°06.0'W
SFC B 110 to	G	CNX 241/16	34°17.5'N 105°59.5'W
SFC B 110 to	H	CNX 176/35	33°47.5'N 105°47.5'W
SFC B 125 to	I	CNX 167/38	33°43.5'N 105°40.5'W
SFC B 125 to	J	CNX 143/44	33°41.5'N 105°19.5'W
SFC B 125 to	K	ROW 292/32	33°38.0'N 105°09.0'W
SFC B 110 to	L	ROW 333/34	33°53.0'N 104°48.0'W
SFC B 110 to	M	ROW 344/34	33°54.0'N 104°40.0'W
SFC B 110 to	N	ROW 057/33	33°32.0'N 104°00.0'W
SFC B 110 to	O	ROW 056/43	33°36.0'N 103°50.0'W
SFC B 110 to	P	ROW 042/49	33°49.0'N 103°49.0'W
SFC B 110 to	Q	CVS 232/27	34°10.0'N 103°48.0'W

**TERRAIN FOLLOWING OPERATIONS:** Terrain following operations authorized entire route.

**ROUTE WIDTH** - 2 NM left and 28 NM right of centerline from A to B; 28 NM either side of centerline from B to C; 28 NM either side of centerline decreasing to 5 NM either side of centerline from C to D; 5 NM either side of centerline D to L; 1.5 NM either side of centerline from L to P; 5 NM left and 3 NM right of centerline from P to Q.

**Special Operating Procedures:**

- (1) Non 27 TFW aircraft entry times are booked no closer than 15 minutes. Users must meet booked Entry and Exit times plus or minus 5 minutes. If unable to meet planned entry time enter at an Alternate Entry so as to meet booked exit time or do not enter the route. Route times are planned at 480 kts ground speed.
- (2) Aircraft must call in-the-blind route entry and exit on 255.4. Monitor 255.4 while on route unless operational constraints dictate otherwise.
- (3) Alternate Exit: C, D, E, F, G, H, J, K, L, M, N, P.
- (4) Alternate Entry: B, C, D, E, F, G, H, I, J, K, L, M, N, O, P.
- (5) Do not proceed beyond P unless scheduled for R-5104/R-5105 (Melrose Range Complex).
- (6) Route conflicts with IR-113, IR-133, IR-109, IR-111 and VR-1195/1107. Consult FLIP AP/1B chart for particulars. Deconfliction is by 27 TFW scheduling.

**FSS's Within 100 NM Radius:**

ABQ, AMA, CNM, ELP, INK, LVS, MAF, ROW, TCC, TCS

**APPENDIX B**

**PRINTOUTS OF MAIIS MODELING RUNS**

MAILS - VERSION 1.1 (2/15/90): MULTIPLE AIRCRAFT INSTANTANEOUS LINE SOURCE MODEL

**PARTICULATE CONCENTRATIONS RESULTING FROM REVISED SORTIE ESTIMATES**  
\*\*\*\*\*

Pollutant : PART No. of Aircraft (Types) : 2  
Avg. Period: 24-hour Mixing Height : 5000 ft.

Aircraft	Altitude (ft)	Airspeed (mph)	Emiss. Rate (lb/hr)	Flight Freq.	24-hour Conc. (micrograms/m**3)
EF-111	500	546	6.05	3	.0004
F-111	500	546	4.36	0	0.00E+00
Total 24-hour conc. =					.0004

The total 24-hour conc. is 4.94E-03 % of the PSD  
Class I 24-hour increment for PART( 8 micrograms/m\*\*3)

PARTICULATE CONCENTRATIONS RESULTING FROM REVISED SORTIE ESTIMATES

\*\*\*\*\*

Pollutant : PART No. of Aircraft (Types) : 2  
Avg. Period: Annual Mixing Height : 5000 ft.

Aircraft	Altitude (ft)	Airspeed (mph)	Emiss. Rate (lb/hr)	Flight Freq.	Annual Conc. (micrograms/m**3)
EF-111	500	546	6.05	396	5.71E-05
F-111	500	546	4.36	0	0.00E+00
Total annual conc. =					5.71E-05

The total annual conc. is 1.43E-03 % of the PSD  
Class I annual increment for PART( 4 micrograms/m\*\*3)

MAILS - VERSION 1.1 (2/15/90): MULTIPLE AIRCRAFT INSTANTANEOUS LINE SOURCE MODEL

SO2 CONCENTRATIONS RESULTING FROM MODIFIED SORTIE ESTIMATES

\*\*\*\*\*

Pollutant : SO2	No. of Aircraft (Types) : 2				
Avg. Period: 3-hour	Mixing Height : 5000 ft.				
Aircraft	Altitude (ft)	Airspeed (mph)	Emiss. Rate (lb/hr)	Flight Freq.	3-hour Conc. (micrograms/m**3)
EF-111	500	546	18.17	2	.0126
F-111	500	546	18.16	0	0.00E+00
Total 3-hour conc. =					.0126

The total 3-hour conc. is .0506 % of the PSD  
Class I 3-hour increment for SO2 ( 25 micrograms/m\*\*3)

SO2 CONCENTRATIONS RESULTING FROM MODIFIED SORTIE ESTIMATES

\*\*\*\*\*

Pollutant : SO2	No. of Aircraft (Types) : 2				
Avg. Period: 24-hour	Mixing Height : 5000 ft.				
Aircraft	Altitude (ft)	Airspeed (mph)	Emiss. Rate (lb/hr)	Flight Freq.	24-hour Conc. (micrograms/m**3)
EF-111	500	546	18.17	3	.0012
F-111	500	546	18.16	0	0.00E+00
Total 24-hour conc. =					.0012

The total 24-hour conc. is .0237 % of the PSD  
Class I 24-hour increment for SO2 ( 5 micrograms/m\*\*3)

SO2 CONCENTRATIONS RESULTING FROM MODIFIED SORTIE ESTIMATES

\*\*\*\*\*

Pollutant : SO2	No. of Aircraft (Types) : 2				
Avg. Period: Annual	Mixing Height : 5000 ft.				
Aircraft	Altitude (ft)	Airspeed (mph)	Emiss. Rate (lb/hr)	Flight Freq.	Annual Conc. (micrograms/m**3)
EF-111	500	546	18.17	396	.0002
F-111	500	546	18.16	0	0.00E+00
Total annual conc. =					.0002

The total annual conc. is 8.58E-03 % of the PSD  
Class I annual increment for SO2 ( 2 micrograms/m\*\*3)

MAILS - VERSION 1.1 (2/15/90): MULTIPLE AIRCRAFT INSTANTANEOUS LINE SOURCE MODEL

NO2 CONCENTRATIONS RESULTING FROM MODIFIED SORTIE ESTIMATES

\*\*\*\*\*

Pollutant : NO2	No. of Aircraft (Types) : 2				
Avg. Period: Annual	Mixing Height : 5000 ft.				
Aircraft	Altitude	Airspeed	Emiss. Rate	Flight	Annual Conc.
	(ft)	(mph)	(lb/hr)	Freq.	(micrograms/m**3)
EF-111	500	546	346.00	396	.0033
F-111	500	546	508.48	0	0.00E+00
Total annual conc. = .0033					

The total annual conc. is .1307 % of the PSD  
Class I annual increment for NO2 ( 2 micrograms/m\*\*3)

**APPENDIX C**  
**TRANSCRIPT FROM PUBLIC HEARING**

CANNON AIR FORCE BASE REALIGNMENT EIS  
PUBLIC HEARING - 22 JANUARY 1992

HELD AT  
PORTALES HIGH SCHOOL AUDITORIUM  
PORTALES, NEW MEXICO

(The hearing began at 1900 hours, 22 January 1992.)

LT COL WILLARD L. POPE, JR:

Good evening, ladies and gentlemen. This is the public hearing on the Draft Environmental Impact Statement for the Cannon Air Force Base realignment. My name is Lt Col Lee Pope and I will be Presiding Officer for tonight's meeting.

This hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. The Act requires federal agencies to analyze potential environmental impacts of certain proposed actions and alternatives, and to consider the findings of those analyses in deciding how to proceed.

Previously, in August of 1991, scoping meetings were held to get your input on the scope of the Environmental Impact Statement or "EIS." Since that meeting, the Air Force has studied the identified environmental concerns and has prepared and distributed a draft of the EIS.

The purpose of tonight's hearing is to receive your comments, suggestions, and criticisms of the Draft EIS. The draft copy of the Environmental Impact Statement was placed in various public locations. If you have not had an opportunity to review the document, the presenters will go over some of the findings contained in the Draft EIS.

Before introducing the members of the panel, I'd like to explain my role in this hearing. I am a Military Judge and primarily serve as a Circuit Trial Judge for court-martial cases. Therefore, for me, it's a welcome diversion from the criminal trial arena to preside over an Environmental Impact Hearing such as this.

I would like to emphasize that I am not here as an expert on this Draft EIS, nor have I had any connection with its development. I am not here to act as a legal advisor to the Air Force representatives who will address these proposals. My purpose simply is to ensure we have a fair, orderly hearing--and that all who wish to be heard have a fair chance to speak.

Now, I'd like to introduce the members of the public hearing panel

First is Col David Benson (Col Benson stood), the Commander of the 27th Support Group at Cannon Air Force Base. (Col Benson resumed his seat.)

There's Mr. Larry Nygren (Mr. Nygren stood), the Deputy Base Civil Engineer for the base. (Mr. Nygren resumed his seat.)

There's Mr. Jim Richards (Mr. Richards stood), Chief of Environmental Management. (Mr. Richards resumed his seat.)

And there's Maj Rick Olson (Maj Olson stood), the Chief of Public Affairs. (Maj Olson resumed his seat.)

On stage with me are the two people who will actually be making presentations:

Lt Col Robert Brewster (Lt Col Brewster stood), the Chief of the Base Expansion Office. (Lt Col Brewster resumed his seat.)

And there's Ms. Brenda Cook (Ms. Cook stood), from Headquarters, Tactical Air Command, Environmental Analysis Division. (Ms. Cook resumed her seat.)

This informal meeting is intended to provide a continuing public forum for two-way communication about the Draft EIS, with a view to improving the overall decision-making process.

You'll notice I said "two-way communication." In the first part of the hearing, our most knowledgeable folks will brief you on details of the actions and the anticipated environmental impacts. The second part of the process will give you an opportunity to provide information, and make statements for the record. This ensures...this input ensures the decision makers may benefit from your knowledge of the local area and any adverse environmental effects you think may result from the proposed action or alternatives.

Let me say now what this hearing is not. This hearing isn't going to be a debate, nor a referendum, nor a vote on the alternative actions analyzed in the EIS. Those things don't add anything to the hearing and simply waste your valuable time during this important opportunity for personal input into the decision-making process. The focus of the meeting is on the environmental impacts associated with the proposals being studied by the Air Force. Comments on non-environmental issues should not be raised at this hearing.

When you came in tonight, you were provided an attendance form and you were asked to indicate on it whether you wished to speak tonight. After the speakers have finished their presentations, we will make sure and collect all the cards. Based on the number of people who have indicated they want to

speak, we will then ask those people to speak. Should an elected official be present and ask to speak, they will be allowed to speak first.

Now if you don't feel like standing up here tonight and making a statement orally, you have until February 16th of this year to submit a copy of your statement for the Air Force's consideration prior to publishing the Final EIS. The Air Force will continue to accept comments after February 16th, but the Air Force cannot guarantee late comments will be included in the Final EIS. Special sheets are provided at the entrance to the auditorium for your use in providing these comments. Even if you make comments today, remember, you have until February 16th to submit additional written comments to the address shown on the comment sheet, and later on, a slide will show you the address that you may send your comments to.

Whether a statement is made orally or submitted in writing either tonight or later, the statement will have the same impact and will be considered to the same extent, so don't feel like you have to speak tonight if you prefer to wait and submit something by February 16th. On the other hand, don't be shy or hesitant to make a statement. I want to ensure all who wish to speak have a fair chance to be heard.

You may have noticed we have a Court Reporter, Ms. Marilyn McMillan, who will take down verbatim everything that is said tonight. The verbatim record will become a part of the Final EIS. Ms. McMillan will be able to make a complete record only if she can hear and understand what you say. With that in mind, please help me enforce the following ground rules:

First, only speak after I've recognized you and please address your remarks to me. If you have a written statement, you may hand it in or you may read it or you may do both.

Second speak clearly and slowly into the microphone, down in the middle of the room, start with your name, address, and the capacity in which you appear--a private citizen, a representative of a group, or a public official. This will help our Court Report prepare a professional transcript.

Each person will be recognized for five minutes.

Please honor any requests that I make for you to stop speaking. If you have more comments than you will be able to present in five minutes, please prioritize your comments to ensure the most important are addressed first.

Fifth, please do not speak while another person is speaking. Only one person will be recognized at a time. And kindly, please refrain from smoking in the auditorium.

I would appreciate your cooperation in abiding by all these rules. I will monitor the times and do everything within my power to make sure everyone who wants to be heard, will be heard.

Again, tonight's objectives are to give you a reasonable opportunity to speak. One thing I cannot express enough, you may have information about the environmental inputs unknown to the Air Force. We are very interested in having and analyzing all potential environmental impacts of the proposed action and alternatives. You have experience that comes from living in this area, so this second part of today's communication, the part that flows from you to us, is important. Don't hesitate to be a part of the proceedings.

I thank everyone for coming today. Your presence is commendable in that it reflects a great interest in your community. I assure you, your interest is the primary purpose for us being here tonight.

Having gotten the preliminaries out of the way, it is now my pleasure to introduce Lt Col Brewster, who will describe the mission statement and the proposed action.

(Lt Col Pope resumed his seat and Lt Col Brewster addressed the attendees.)

**Lt Col Robert Brewster:**

(SLIDE 1 - MISSION STATEMENT)

The mission of the 27th Fighter Wing is to work together as "Team Cannon" to project the world's best sustained all weather, day/night combat capability anywhere and anytime called upon. We will utilize every means possible to increase our deployment readiness and conduct these operations by providing our people with the authority, resources and training required to do their jobs, exemplifying the highest standards, rewarding excellence, and providing the best quality of life, excellence in all aspects of health care, and world class combat support.

(SLIDE 2 - BASE REALIGNMENT AND CLOSURE--PUBLIC LAW 101-510)

The realignment of Cannon Air Force Base results from the recommendations of the Defense Secretary's Commission on Base Realignment and Closure and from the legislative requirements in the Defense Base Closure and Realignment Act of 1990, Public 101-510. Therefore, the decision to expand Cannon Air Force Base has already been made. The alternative of not expanding the base is not open for study or discussion. The current realignment should be considered in light of the 1990 realignment which involved the co-location of all similar mission, U.S. based F-111 aircraft at Cannon Air Force Base and the creation of the Mt

Dora MOA This realignment was to have increased the primary aircraft authorizations from 62 to 108. However, the number of aircraft only increased by 15, for a total of primary aircraft authorizations of 77. Later program change requests cancelled the remaining 31 aircraft.

(SLIDE 3 - 1991 REALIGNMENT ACTIONS)

The actions associated with the current realignment are as follows:

The beddown of 25 EF-111 aircraft from Mt. Home Air Force Base, Idaho and RAF Upper Heyford, United Kingdom.

The beddown of 2 F-111F aircraft from McClellan Air Force Base, California.

The conversion of 59 F-111D aircraft to 60 F-111F aircraft.

And the conversion of 18 F-111G aircraft to 18 F-111E aircraft.

This realignment will co-locate all F-111 and EF-111 assets to a single base within the continental United States.

(SLIDE 4 - 1991 REALIGNMENT SUMMARY)

The 1991 realignment will result in a total of 105 primary aircraft authorizations, which is 3 less aircraft than the number originally projected and evaluated in the 1990 Realignment Environmental Impact Survey. Military construction projects totaling \$25 million are scheduled for fiscal year '93 and manpower will increase by approximately 1,028 persons. No additional special use airspace is proposed.

I'll be followed now by Ms. Brenda Cook of Headquarters, TAC.

(Lt Col Brewster resumed his seat, and Ms. Cook addressed the attendees.)

MS. BRENDA COOK:

Good evening ladies and gentlemen. I'm pleased to be here tonight to tell you about the National Environmental Policy Act and to summarize the impacts found in the Draft Environmental Impact Statement.

(Slide 5 - NATIONAL ENVIRONMENTAL POLICY ACT OF 1969)

The National Environmental Policy Act of 1969 is our national charter for the protection of the environment. The Environmental Impact Statement is part of a federal agency's responsibility under NEPA. Therefore, in accordance with the National Environmental Policy Act, Air Force Regulations, and the Base

Realignment and Closure Act, we have prepared a Draft Environmental Impact Statement on the realignment of Cannon Air Force Base.

As part of the process, we encourage public involvement. A public participation program for the Environmental Impact Statement includes the following actions to solicit public involvement:

First, a notice of intent to prepare an EIS was filed with the Federal Register on August 5th, 1991. At the same time, various press releases were issued and announcement letters sent to federal, state and local officials around Cannon Air Force Base. Later in August, as you know, we hosted public scoping meetings both in Clovis and here in Portales to determine the significant issues, exactly what we would consider in the EIS. These issues are analyzed in the Draft Environmental Impact Statement.

The Draft EIS was filed with the Environmental Protection Agency on 27 December 91. Again, various press releases were issued and announcement letters sent out. We are currently in the 45-day public comment period. During public hearings like this one tonight, we'll collect comments and any written statements you wish to submit. We will then consider all relevant issues and provide responses in the Final EIS. Copies of the Draft are available for review at public libraries. Individuals may request copies in writing by writing to this address:

(SLIDE 6 - MAIL COMMENTS/STATEMENTS NO LATER THAN)

Or by checking the appropriate blank on the speaker request form found at the front table. I'd like to point out that the transcript from tonight's hearing, along with any written statements submitted prior to February 16, 1992, the cut-off date for public comment, will be included in the Final EIS. Our plan is to publish the Final EIS around April '92. It will then be filed with the Environmental Protection Agency, and once again, news releases will be made and notification letters sent.

(SLIDE 7 - COMPARISON OF IMPACTS)

At this time, I'd like to address the findings contained in the Draft Environmental Impact Statement. Within the Draft EIS, we analyzed the proposed action, a no action alternative, and a delayed action alternative. Within each resource area, we've determined that the no action alternative will contribute no change to the existing environment. In other words, everything stays the same. Under the delayed action alternative, assuming the environment does not materially change, this alternative would contribute the same impact as the proposed action. However, the projected effects would be spread out over a longer period of time. The impacts associated with the proposed action are:

Land Use -- Land within the 65 decibel contour at Cannon Air Force will increase by 20%. The affected area is primarily agricultural land and we expect no adverse impact on land use.

Air Quality -- Emissions in the vicinity of Cannon AFB and Melrose Range affect the MTRs, MOAs and Ranges will increase. However, this increase will have no significant impact on air quality. And in no area will the proposed action result in non-conformance with the Clean Air Act of 1990.

Noise -- The area encompassed within the 65 decibel contour near Cannon Air Force Base will increase by 20%. Again, the affected area is primarily agricultural land and few additional people will be exposed to noise levels about 65 decibels. Noise levels will increase on land under the affected MTRs and MOAs. The average noise level under an MTR will increase from two to five decibels, with one route increasing by eight decibels and another route increasing by twelve decibels. Although noise increase on these levels will be noticeable, from a general perspective, the noise level is still below 65 decibels, and we anticipate limited to no noise complaints and no impact to residents' ability to obtain FHA and VA loan guarantees. Noise levels on the affected ranges would increase by two decibels on Red Rio and negligibly on Oscura Range. Land underlying the 65 decibels contour on the Melrose Range would increase by 25 square miles. Again, the affected area outside the restricted easement is primarily agricultural, with sparse population, so few additional people would be affected.

Airspace Management -- No adverse impact on airspace utilized by other air traffic is projected, however, vigilance should be exercised in those unrestricted areas where military activity is projected to increase.

Socioeconomics -- The realignment will increase population in Clovis and Portales and generate employment and earnings at the base and in local communities. School enrollment will increase and community services may be strained in the short term. Utility demands will be within the area capacity. Low-priced housing is in short supply in the areas affected by the action, and the realignment will aggravate this condition. Additionally, electromagnetic emissions from electronic countermeasure training is not expected to adversely affect radio communications, television, or microwave/telephone service in the area.

Biology -- Construction at Cannon Air Force Base and Melrose Range is of small scale and in previously disturbed areas. Increased noise levels, use of chaff and flares, and electromagnetic emissions is not expected to result in significant adverse impact to biota or to human health.

Water -- The proposed action will have no adverse impact to surface or ground water resources.

Archaeology -- Archaeological, cultural, or historical resources would not adversely be affected by construction, since the affected areas on Cannon

Air Force and Melrose Range have been previously disturbed and have low potential for such resources. Additionally, the vibration related impacts associated with aircraft overflight at low altitude is not expected since known above ground resources will continue to be avoided under existing flight rules.

That concludes my portion of the briefing. I would like to turn the meeting back over to Col Pope.

(Ms Cook resumed her seat and Col Pope addressed the attendees.)

**LT COL POPE:**

In a moment, we'll move to the main portion of the meeting which is the public comment period. I'd ask the Public Affairs person to bring me those.

(PA person presented the speaker forms to Lt Col Pope.)

We apparently have one person who's indicated they wish to make a comment or ask a question. After that person speaks, I'll ask if anyone has changed their mind, someone who did not fill out a form. Let me just remind you that we ask you to keep your comments to five minutes, address them to me. If there's a question, I'll turn it over to one of the experts. I will make this caveat before we begin. The Air Force representatives gathered before you are not the decision makers regarding the proposed action or alternatives. They have provided information and are prepared to provide clarification if needed. However, they cannot enter into a debate on the pros and cons of the actions, nor discuss issues which are irrelevant to the Environmental Impact Statement process. Please limit your comments to the environmental issues associated with the actions described in the Draft EIS.

Mr. Marshall Stinnett --

**MR. MARSHALL STINNETT:**

I've decided not to speak, sir.

**LT COL POPE:**

Okay. You have no question or comment, all right. As I said, I would give anyone else in the room a chance to change their mind if you did not initially indicate that you wished to make a comment or ask a question but would wish to do so now. The floor is open for that.

(An attendee indicated he wished to speak.)

LT COL POPE:

If you wish to come to the microphone and identify yourself, you may do so.

MR. CARL J. HEBERT:

Yes, my name is Carl Hebert. I reside at 1011 South Globe in Portales. I'm a private citizen, actually inquiring about the employment summary for Roosevelt and Curry Counties on Table 3.5-2. And since...according from the information I could find from the survey, it's showing low numbers of Roosevelt County individuals, federal/military and federal/civilian employees. Is there any way of verifying what is the true count as of a current deal? Because since the time this was published, the base has already expanded with the G-models. So, I'm trying to find out, is this a valid number shown? What is the current population before the actual expansion?

LT COL POPE:

Okay. So I take it your question is you question the reliability of that figure?

MR. HEBERT:

Yes.

LT COL POPE:

Ms. Cook, can you address that now as to the reliability of that figure? If so, if you'd come to the microphone.

MS. BRENDA COOK:

Sir, would you please clarify the question? I'm sorry, I really don't --

MR. HEBERT:

Okay. On page 3-52 --

MS. COOK:

Yes.

MR. HEBERT.

-- if you look under the column where it says, "Roosevelt County, Federal/Civilian" is 68 total; "Federal/Military" 68 also. What I'm trying to

clarify is, is that an accurate count since the expansion with the G-model is already ..I'm trying to find out what is the present count before the projected expansion.

MS. COOK:

Yes, sir, I would say the summary is valid. It was obtained from the economic analysis from the Regional Economic Information System, April of '91.

MR. HEBERT:

And where was their source?

MR. AL CHAVEZ:

That's the annually maintained data and comes from the Office of Economics Analysis.

MR. HEBERT:

So, in other words, they don't get this information from the base?

MS. COOK:

I believe the base probably is providing the information to them upon request.

MR. HEBERT:

What I'm suggesting is this information is not accurate, if it could be verified?

MS. COOK:

Yes, sir, we can verify that before the Final is completed.

MR. HEBERT:

Thank you very much.

(Mr. Hebert and Ms. Cook resumed their respective seats.)

LT COL POPE:

For the record Mr. Al Chavez from the same office as Ms. Cook spoke and gave a partial response to that question. Your comment has been noted for the record and will be addressed in the final report, at least will be noted.

Okay, anyone else wish to speak at this time?

(No response.)

Apparently not. And I would remind all those present that you have until February 16th to make any written comment and it will be part of the Final EIS and will be considered by the Air Force in making its final decision.

If there are no other inputs, I would again thank you all for coming out tonight and commend you for your public spiritedness, and I would thank the participants. And if there is nothing further, this hearing is adjourned.

(The hearing adjourned at 1925 hours, 22 January 1992.)

I CERTIFY THAT THE FOREGOING IS A VERBATIM TRANSCRIPT OF THE CANNON AFB REALIGNMENT EIS HEARING HELD AT THE PORTALES HIGH SCHOOL AUDITORIUM, PORTALES, NEW MEXICO, ON 22 JANUARY 1992.

*Marilyn McMillan*

MARILYN K. MCMILLAN  
COURT REPORTER

## 27 FW MISSION STATEMENT

TO WORK TOGETHER AS TEAM CANNON TO PROJECT THE WORLD'S BEST SUSTAINED ALL WEATHER, DAY/NIGHT COMBAT CAPABILITY ANYWHERE AND ANYTIME CALLED UPON. WE WILL UTILIZE EVERY MEANS POSSIBLE TO INCREASE OUR DEPLOYMENT READINESS AND CONDUCT THESE OPERATIONS BY

- PROVIDING OUR PEOPLE WITH THE AUTHORITY, RESOURCES AND TRAINING REQUIRED TO DO THEIR JOBS.
- EXEMPLIFYING THE HIGHEST STANDARDS AND REWARDING EXCELLENCE.
- PROVIDING THE BEST QUALITY OF LIFE, EXCELLENCE IN ALL ASPECTS OF HEALTH CARE AND WORLD CLASS COMBAT SUPPORT.

# BASE REALIGNMENT AND CLOSURE

PUBLIC LAW 101 - 510

## 1991 REALIGNMENT ACTIONS

- BEDDOWN OF 25 EF-111 AIRCRAFT FROM MT HOME AFB, ID AND RAF UPPER HEYFORD AB, UK
- BEDDOWN OF 2 F-111F AIRCRAFT FROM MCCLELLAN AFB, CA
- CONVERSION OF 59 F-111D AIRCRAFT TO 60 F-111F AIRCRAFT
- CONVERSION OF 18 F-111G AIRCRAFT TO 18 F-111E AIRCRAFT

# 1991 REALIGNMENT SUMMARY

## CANNON AFB NEW MEXICO

- TOTAL OF 105 PRIMARY AIRCRAFT AUTHORIZATIONS
- \$25 MILLION SCHEDULED CONSTRUCTION
- MANPOWER AUTHORIZATIONS INCREASE BY 1,028
- NO ADDITIONAL SPECIAL USE AIRSPACE IS PROPOSED

# NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

## PUBLIC PARTICIPATION PROGRAM

- \* NOTICE OF INTENT
- \* SCOPING MEETINGS
- \* PUBLIC COMMENT PERIOD
  - \*\* REVIEW DRAFT EIS
  - \*\* PUBLIC HEARINGS
- \* CIRCULATION OF FINAL EIS
- \* NEWS RELEASE / ANNOUNCEMENTS

MAIL COMMENTS/STATEMENTS NO LATER THAN

FEBRUARY 16, 1992

HQ TAC/DEVE

ATTN: MS BRENDA COOK

ANGLEY AFB VA 23665-5542

## COMPARISON OF IMPACTS

	PROPOSED ACTION	NO ACTION	DELAYED ACTION
LAND USE	-	o	-
AIR QUALITY	-	o	-
NOISE	-	o	-
AIRSPACE MANAGEMENT	o	o	o
SOCIOECONOMICS	-	o	o
BIOLOGY	o	o	o
WATER	o	o	o
ARCHAEOLOGY	o	c	c

CANNON AIR FORCE BASE REALIGNMENT  
SPEAKER'S REQUEST/COMMENT FORM

NAME: Chet J. Heber

Organization/Agency: \_\_\_\_\_

Please check type of organization:

Federal Agency \_\_\_\_\_ State Agency \_\_\_\_\_ Local Group \_\_\_\_\_ Individual

Mailing Address: 1011 South Glorieta Ave. Fortimes, NM 88130

Telephone: 505-356-3706

Check here if you wish to speak today: Yes

Check here if you would like a copy of the Final Environmental Impact Statement:

CANNON AIR FORCE BASE REALIGNMENT EIS  
PUBLIC HEARING - 21 JANUARY 1992

HELD AT  
TOWN HALL, CLOVIS COMMUNITY COLLEGE  
CLOVIS, NEW MEXICO

(The hearing began at 1900 hours, 21 January 92 )

**LT COL WILLARD L. POPE, JR:**

Good evening ladies and gentlemen, this is the public hearing on the Draft Environmental Impact Statement, for the Cannon Air Force Base realignment. My name is Lt Col Lee Pope, and I will be the Presiding Officer for tonight's meeting.

This hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. The Act requires federal agencies to analyze potential environmental impacts of certain proposed actions and alternatives, and to consider the findings of those analyses in deciding how to proceed.

Previously, in August of 1991, scoping meetings were held to get your input on the scope of the Environmental Impact Statement or "EIS". Since that meeting, the Air Force has studied the identified environmental concerns and has prepared and distributed a Draft of the EIS.

The purpose of tonight's hearing is to receive your comments, suggestions and criticisms of the Draft EIS. The Draft EIS was circulated among various public locations. If you have not had a chance to read the Draft EIS, its findings will be addressed by panel members in their presentations.

Before introducing the members of the panel, I'd like to explain my role in this hearing. I am a Military Judge and serve primarily as a Circuit Trial Judge for court-martial cases. I'm stationed at Travis Air Force Base, California, and I cover five Western states normally. It is a welcome diversion for me to be away from the criminal trial arena to preside over an Environmental Impact Hearing such as this.

I would like to emphasize that I'm not here as an expert on this Draft EIS, nor have I had any connection with its development. I am not here to act as a legal advisor to the Air Force representatives who address these proposals. My purpose is simply to ensure we have a fair, orderly hearing--and that all who wish to be heard have a fair chance to speak.

Now, I'd like to introduce the members of the public hearing panel. They're in two groups. First, I'll introduce the members who are seated in the audience:

First is Col David Benson (Col Benson stood), the Commander of the 27th Support Group (Col Benson resumed his seat.)

Then, Maj Tim Wise (Maj Wise stood), the Base Civil Engineer. (Maj Wise resumed his seat )

Mr. Jim Richards (Mr. Richards stood), the Chief of Environmental Management (Mr. Richards resumed his seat.)

Maj Rick Olson (Maj Olson stood), Chief of Public Affairs. (Maj Olson resumed his seat.)

On the stage with me are two members who will be making presentations. They are first:

Lt Col Robert Brewster (Lt Col Brewster stood), the Chief of the Base Expansion Office. (Lt Col Brewster resumed his seat.)

And Ms. Brenda Cook (Ms. Cook stood), from Headquarters TAC, Tactical Air Command, at Langley Air Force Base, from the Environmental Analysis Division. (Ms. Cook resumed her seat.)

This informal meeting is intended to provide a continuing public forum for two-way communication about the Draft EIS, with a view to improving the overall decision-making process.

You'll notice I said, "two-way communication." In the first part of the hearing process, our most knowledgeable folks will brief you on details of the actions and the anticipated environmental impacts. The second part of the process will give you an opportunity to provide information and make statements for the record. This input ensures the decision makers may benefit from your knowledge of the local area and any adverse environmental effects you think may result from the proposed action or alternatives.

Now, let me say what this hearing is not. This isn't going to be a debate, nor a referendum, nor a vote on the alternative actions analyzed in the EIS. Those things don't add anything to the hearing and simply waste your valuable time during this opportunity for personal input to the decision-making process. The focus of the meeting is on the environmental impacts associated with the proposals being studied by the Air Force. Comments on non-environmental issues should not be raised at this hearing.

When you came in tonight, you were provided an attendance form and you were asked to indicate on it if you wished to speak tonight. After the speakers

have finished their presentations, we will make sure that we have had a chance to collect all the forms. Now, that is the method we're going to use to recognize people and ask them to come up and make their comments or answer questions. Some of you may have been confused about making comments and asking questions. So if you did not indicate that you wanted to speak, you may still do so by retrieving your form and checking the block that says you want to be a speaker. You could help me out if you want to be a speaker, if you could print your name, then I might be able to read it where you can recognize who I'm trying to recognize.

If you don't feel like standing up here tonight and making a statement orally, you have until February 16th of this year to submit a copy of your statement for the Air Force's consideration prior to publishing the Final EIS. The Air Force will continue to accept comments after February 16th, but the Air Force cannot guarantee late comments will be included in the Final EIS. Special sheets are provided at the entrance to the auditorium for your use in providing these comments. Even if you make comments today, remember, you have until February 16th to submit additional written comments to the address on the comment sheets and it will be on a slide in a later presentation.

Whether a statement is made orally or submitted in writing either tonight or later, the statement will have the same weight and will be considered to the same exact extent, so don't feel like you have to speak tonight if you prefer to wait and submit something by February 16th. On the other hand, please don't be shy or hesitant to make a statement. I want to ensure all who wish to speak have a fair chance to be heard.

You may have noticed we have a Court Reporter, Ms. Marilyn McMillan, who will take down verbatim everything that is said tonight. The verbatim record will become a part of the Final EIS. Ms. McMillan will be able to make a complete record only if she can hear and understand what you say. With that in mind, please help me enforce the following ground rules:

First, only speak after I recognize you and please address your remarks to me. If it's a written statement, you may hand it in. You may read the written statement and hand it in, any combination you wish.

Second, speak clearly and slowly into the microphone, starting with your name, address, and capacity in which you appear -- if you're a private citizen, if you're a public official or if you're representing a designated group. This will help our Court Reporter prepare a professional transcript.

Each person will be recognized for five minutes.

Please honor any requests that I may make for you to stop speaking. If you have more comments than you will be able to present in five minutes, please prioritize your comments to ensure the most important are addressed first.

Please do not speak while another person is speaking. Only one person will be recognized at a time.

And as the sign on the entry way said, please refrain from smoking or drinking in the auditorium.

I would appreciate your cooperation in abiding by all of these rules. I will monitor the times and do everything within my power to make sure that everyone who wants to be heard, will be heard.

One thing I can't stress enough, you may have information about environmental inputs unknown to us. We are very interested in having and analyzing all potential environmental impacts of the proposed action and alternatives. You have experience that comes from living in this area, so the second part of today's communication, the part that flows from you to us, is important. Don't hesitate to be a part of the proceedings.

I thank everyone for coming today. Your presence is commendable in that it reflects a great interest in your community. I assure you, your interest is the primary purpose for us being here.

At this time, it is now my pleasure to introduce Lt Col Brewster, who will describe the proposed action and a mission statement.

(Lt Col Pope resumed his seat and Lt Col Brewster addressed the attendees.)

**Lt Col Robert Brewster:**

(SLIDE 1 - MISSION STATEMENT)

The mission of the 27th Fighter Wing is to work together as "Team Cannon" to project the world's best sustained all-weather, day/night, combat capability anywhere and anytime called upon. We will utilize every means possible to increase our deployment readiness and conduct these operations by providing our people with the authority, resources, and training required to do their jobs, exemplifying the highest standards and rewarding excellence and providing the best quality of life, excellence in all aspects of health care, and world class combat support.

(SLIDE 2 - BASE REALIGNMENT AND CLOSURE--PUBLIC LAW 101-510)

The realignment of Cannon Air Force results from the recommendations of the Defense Secretary's Commission on Base Realignment and Closure and from the legislative requirements in the Defense Base Closure and Realignment Act of

1990, Public Law 101-510. Therefore, the decision to expand Cannon Air Force Base has already been made. The alternative of not expanding the base is not up for study or discussion. The current realignment should be considered in light of the 1990 realignment which involved the co-location of all similar mission, U.S based F-111 aircraft at Cannon Air Force Base and the creation of the Mt Dora MOA. This realignment was to have increased the primary aircraft authorizations from 62 to 108. However, the number of aircraft only increased by 15, for a total of primary aircraft authorizations of 77. Later program change requests cancelled the remaining 31 aircraft.

(SLIDE 3 - 1991 REALIGNMENT ACTIONS)

The actions associated with the current realignment are as follows:

Beddown of 25 EF-111 aircraft from Mt Home Air Force Base, Idaho, and RAF Upper Heyford, United Kingdom.

Beddown of two F-111F -- beddown of two F-111F test aircraft from McClellan Air Force Base, California.

Conversion of 59 F-111D aircraft to 60 F-111F aircraft.

Conversion of 18 F-111G aircraft to 18 F-111E aircraft.

This realignment will co-locate all F-111 and EF-111 aircraft to a single base within the continental United States.

(SLIDE 4 - 1991 REALIGNMENT SUMMARY)

The 1991 realignment will result in a total of 105 primary aircraft authorizations, which is 3 less aircraft than the number originally projected and evaluated in the 1990 realignment EIS. Military construction projects, totaling \$25 million, are scheduled for fiscal year '93 and manpower will increase by approximately 1,028 persons. No additional special-use airspace is proposed.

Now, Ms. Brenda Cook from Headquarters TAC will make her presentation.

(Lt Col Brewster resumed his seat, and Ms. Cook addressed the attendees.)

**MS. BRENDA COOK:**

Good evening ladies and gentlemen. I'm pleased to be with you tonight to tell you about the National Environmental Policy Act and to summarize the impacts found in the Draft Environmental Impact Statement we've prepared.

(SLIDE 5 - NATIONAL ENVIRONMENTAL POLICY ACT OF 1969)

First of all, the National Environmental Policy Act of 1969 is our national charter for the protection of the environment. The Environmental Impact Statement is a federal...is part of a federal agency's responsibility under NEPA. Therefore, in accordance with the National Environmental Policy Act, Air Force Regulations, and the Base Realignment and Closure Act, we have prepared the Draft Environmental Impact Statement on the realignment activities at Cannon Air Force Base.

As part of the process, we encourage public involvement. A public participation program for the Environmental Impact Statement includes the following actions to solicit public involvement:

First, a notice of intent to prepare an EIS was published in the Federal Register on 5 August 1991. At the same time, various press releases and announcement letters were sent to federal, state and local officials around Cannon Air Force Base. Later in August, as you know, we had public scoping meetings here in Clovis and in Portales to determine significant issues, exactly what we would consider in the EIS. These issues are analyzed in the Draft Environmental Impact Statement.

The Draft EIS was filed with the Environmental Protection Agency on 27 December 1991. Again, various press releases and announcement letters were sent out. We are currently in a 45-day public comment period. During public hearings like this one, we'll collect comments and any written statements you wish to submit. We will then consider all relevant issues raised and provide responses in the Final EIS.

(SLIDE 6 - MAIL COMMENTS/STATEMENTS NO LATER THAN)

I'd like to point out that the transcript from tonight's hearing, along with any written statements submitted prior to February 16, 1992, the cut-off date for public comment, will be included in the Final EIS. Our plan is to publish the Final EIS around April of 1992. It will then be filed with the Environmental Protection Agency, and once again, news releases and announcement letters will be sent.

(SLIDE 7 - COMPARISON OF IMPACTS)

At this time, I'd like to address the findings contained in the Draft Environmental Impact Statement. Within the Draft EIS, we analyzed the proposed action, the no action alternative, as well as a delayed action alternative. Within each resource area, it was determined that no action alternative would contribute no change to the existing environment. In other words, everything stays the same. Under the delayed action alternative, assuming that the

environment does not materially change, this alternative would contribute the same impact as the proposed action. However, the projected effect would be spread out over a longer period of time. The impacts associated with the proposed action are:

Land Use -- Land within a 65 decibel contour at Cannon Air Force Base will increase by 20%. The affected area is primarily agricultural land and we expect no adverse impact on land use.

Air Quality -- Emissions in the vicinity of Cannon Air Force Base, the affected MTRs, MOAs and ranges will increase. However, this increase will have no significant impact on air quality. And in no area will the action result in non-conformance with the Clean Air Act of 1990.

Noise -- The area encompassed within the 65 decibel noise contour near Cannon Air Force Base will increase by 20%. Again, because the affected area is primarily agricultural land. Few additional people will be exposed to the noise levels above 65 decibels. Noise levels will increase on land under the affected MTRs and MOAs. The average MTR noise level will increase from two to five decibels, with one route increasing by eight decibels and another increasing by twelve. Although noise increases on these levels will be noticeable, from a general perspective, the noise level will still be below 65 decibels, and we anticipate limited to no noise complaints and no impact to residents' ability to obtain FHA or VA loan guarantees. Noise levels on the affected ranges will increase by two decibels on Red Rio Range and negligibly on Oscura Range. Land underlying the 65 decibels contour on the Melrose Range would increase by 25 square miles. Again, the affected area outside the restricted easement is primarily agricultural land with sparse population, so few additional people would be affected.

Airspace Management -- No adverse impact on air space utilized by other air traffic is projected. However, vigilance should be exercised in those unrestricted areas where military activity is projected to increase.

Socioeconomics -- The realignment will increase population in Clovis and Portales and generate employment and earnings at the base and in local communities. School enrollment will increase and community services may be strained in the short term. Utility demands, however, will be within area capacity. Low-priced housing is in short supply in the areas affected by the action and the realignment will aggravate this condition. Additionally, electromagnetic emissions from electronic countermeasure training is not expected to adversely affect radio communications, television or microwave/telephone service in the area.

Biology -- Construction at Cannon Air Force Base and Melrose Range is of small scale and in previously disturbed areas. Increased noise levels, use

of chaff and flairs and electromagnetic emissions is not expected to result in significant, adverse impact to biota or to human health.

Water -- The proposed action will have no adverse impact on the ground water or surface water resources.

Archeology -- Archeological, cultural, or historical resources will not adversely be affected by construction on the affected areas at Cannon Air Force Base or Melrose Range. Again, these areas are previously disturbed and have low potential impact for such resources. Additionally, vibration related impacts associated with overflight of aircraft at low altitudes is not expected since known above ground resources will continue to be avoided under existing flight rules.

This completes my briefing. I'd like to turn the meeting back over to Lt Col Pope.

(Ms. Cook resumed her seat and Lt Col Pope addressed the attendees.)

LT COL WILLARD L. POPE, JR:

Thank you, Col Brewster and Ms. Cook. That concludes the portion of the hearing in which we give information to you. In a moment, we'll move into the main portion of the meeting, which is the public comment period. Are there any statements that have been received ..forms...where anyone indicated they wish to speak?

(No response.)

We have -- apparently, no one marked any of their forms indicating they wish to make a comment at this time. You're not bound by that. If someone would now wish to make a public comment, this is the period in time in which you would do that. Has anyone changed their mind?

(No response.)

This is also the period of time which you would ask a question as well as make a comment.

(No response.)

Okay. Apparently, we have no public comment. All right. That makes a lot of what I was going to tell you not relevant. So, I guess I can remind you as the slide tells you, --

(SLIDE 6 - MAIL COMMENTS/STATEMENTS NO LATER THAN)

-- you have until February 16th to submit written comments. You can submit them tonight or you can...they must be post-marked before February 16th to be guaranteed that they will be considered in the Final EIS. So, once again, I would like to thank you all for coming. It's a matter of your good civic responsibility on your part and we appreciate you showing up here tonight. If there's nothing further, this hearing is adjourned.

(The hearing adjourned at 1920 hours, 21 January 92.)

I CERTIFY THAT THE FOREGOING IS A VERBATIM TRANSCRIPT OF THE CANNON AFB REALIGNMENT EIS HEARING HELD AT TOWN HALL, CLOVIS COMMUNITY COLLEGE, CLOVIS, NEW MEXICO, ON 21 JANUARY 1992.

*Marilyn McMillan*  
MARILYN K. MCMILLAN  
COURT REPORTER

# 27 FW MISSION STATEMENT

- TO WORK TOGETHER AS TEAM CANNON TO PROJECT THE WORLD'S BEST SUSTAINED ALL WEATHER, DAY/NIGHT COMBAT CAPABILITY ANYWHERE AND ANYTIME CALLED UPON. WE WILL UTILIZE EVERY MEANS POSSIBLE TO INCREASE OUR DEPLOYMENT READINESS AND CONDUCT THESE OPERATIONS BY
- PROVIDING OUR PEOPLE WITH THE AUTHORITY, RESOURCES AND TRAINING REQUIRED TO DO THEIR JOBS.
- EXEMPLIFYING THE HIGHEST STANDARDS AND REWARDING EXCELLENCE.
- PROVIDING THE BEST QUALITY OF LIFE, EXCELLENCE IN ALL ASPECTS OF HEALTH CARE AND WORLD CLASS COMBAT SUPPORT.

# BASE REALIGNMENT AND CLOSURE

PUBLIC LAW 101-510

## 1991 REALIGNMENT ACTIONS

- BEDDOWN OF 26 EF-111 AIRCRAFT FROM MT HOME AFB, ID AND RAF UPPER HEYFORD AB, UK
- BEDDOWN OF 2 F-111F AIRCRAFT FROM MCCLELLAN AFB, CA
- CONVERSION OF 59 F-111D AIRCRAFT TO 60 F-111F AIRCRAFT
- CONVERSION OF 18 F-111G AIRCRAFT TO 18 F-111E AIRCRAFT

# 1991 REALIGNMENT SUMMARY

## CANNON AFB NEW MEXICO

- TOTAL OF 105 PRIMARY AIRCRAFT AUTHORIZATIONS
- \$25 MILLION SCHEDULED CONSTRUCTION
- MANPOWER AUTHORIZATIONS INCREASE BY 1,028
- NO ADDITIONAL SPECIAL USE AIRSPACE IS PROPOSED

# NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

## PUBLIC PARTICIPATION PROGRAM

- \* NOTICE OF INTENT
- \* SCOPING MEETINGS
- \* PUBLIC COMMENT PERIOD
  - \*\* REVIEW DRAFT EIS
  - \*\* PUBLIC HEARINGS
- \* CIRCULATION OF FINAL EIS
- \* NEWS RELEASE / ANNOUNCEMENTS

MAIL COMMENTS/STATEMENTS NO LATER THAN

FEBRUARY 16, 1992

HQ TAC/DEVE

ATTN: MS BRENDA COOK

ANGLEY AFB VA 23665-5542

# COMPARISON OF IMPACTS

PROPOSED ACTION	NO ACTION	DELAYED ACTION
LAND USE	-	o
AIR QUALITY	-	o
NOISE	-	o
AIRSPACE MANAGEMENT	o	o
SOCIOECONOMICS	-	o
BIOLOGY	o	o
WATER	o	o
ARCHAEOLOGY	o	o

**APPENDIX D**  
**COMMENT LETTERS**



# United States Department of the Interior

TAKE [REDACTED]  
PRIDE IN [REDACTED]  
AMERICA [REDACTED]  
[REDACTED]

OFFICE OF THE SECRETARY  
OFFICE OF ENVIRONMENTAL AFFAIRS  
POST OFFICE BOX 649  
ALBUQUERQUE, NEW MEXICO 87103

ER 92/34

Brenda Cook  
United States Air Force  
HQ TAC/DEVE  
Langley AFB, Virginia 23665

Dear Ms. Cook:

This is in response to the U.S. Air Force request for the Department of The Interior (DOI) to review the Draft Environmental Impact Statement (EIS) for the F/EF-111 Basing at Cannon Air Force Base, Curry County, New Mexico. The following comments are provided for your consideration.

## GENERAL COMMENTS

① Mitigation measures are incorporated into Chapter 3, "Description of the Affected Environment," but, to be in conformance with regulations, mitigation measures should be included as part of the proposed action, as well as for the other alternatives under consideration. Also, there is no discussion of the effectiveness of mitigation. For example, it is unclear whether Special Operating Procedure for Instrument Route (IR) 107, to avoid Capulin Volcano National Monument by 2 nautical miles (nm), would be effective in maintaining a quality visitor experience at the Monument.

② Although the following units of the National Park System are referred to in various parts of the document, the statement does not specifically address the proposal's impacts on the visitor experience and resources at: Capulin Volcano National Monument; Petrified Forest National Park; Salinas Pueblo Missions National Monument (sometimes incorrectly identified as Gran Quivira National Monument), which consists of the Abo and Quarai Units in Torrance County and the Gran Quivira Unit in Socorro County; Santa Fe National Historic Trail; and, Wupatki National Monument.

③ It appears that Hubbell Trading Post National Historic Site in Apache County, Arizona, and Fort Union National Monument in Mora County, New Mexico, may also be impacted by the proposal because of proximity to IR-112 to Hubbell and IR-109, IR-110 and IR-111 to Fort Union. Similarly, the Abo and Quarai Units of Salinas Pueblo Missions National Monument may be impacted by the proximity of Visual Route (VR)-100, VR-125 and IR-113. We recommend that the statement include a map which indicates the locations of these Nationally significant areas in relation to the Military Operating Areas, Military Training Routes and Ranges. The statement should thoroughly address impacts to National Park System units and should include appropriate mitigation to avoid adverse impacts to park resources and the visitor experience.

The units of the National Park System that are in the proposal's area of effect are located in rural areas where ambient noise levels are low. One value of these areas is that visitors can escape the noise associated with urban and suburban areas to enjoy the parks' natural scene. Increased noise levels in these units resulting from the proposed substantial increases in flyovers should be avoided by establishing and enforcing strict operational constraints. As the document states on page 3-25, "Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment." This is substantiated by information from the March, 1989, Final Report of the "Methodology for The Measurement and Analysis of Aircraft Sound Levels within National Parks": "As a result of these low background levels, these aircraft operations were clearly audible for extended durations and had very slow onset rates" (page 3-15); and, "Research has shown that sounds with slow onset rates are more disturbing as a result of uncertainty as to the eventual maximum of the sound" (page 3-25).

**(3)** Noise contours and noise level projections are only part of the analysis of impacts. If aircraft noise is noticeable to park visitors, then there will be a degradation of the visitor experience. Higher noise levels at these remote park units would also degrade the cultural landscape which is managed in these units of the National Park System. Noise impacts from aircraft flyovers can cause vibrational damage to cultural resources and can adversely effect the visitor experience at areas that have been set aside by Congress specifically for protection and preservation. These impacts should be addressed.

We note that Appendix A includes "Military Training Route Specifications" for IR's and VR's. These specifications delineate "Special Operating Procedures" which include lateral and/or vertical avoidance of specific areas. Instructions for IR-107 and VR-108 indicate avoidance of Capulin Volcano National Monument by 2 nm; instructions for IR-113 and VR-100 indicate avoidance of Gran Quivira at Salinas Pueblo Missions National Monument by 3 nm. However, in keeping with these criteria, instructions for IR-112 should include avoidance of Wupatki National Monument by 3 nm, and of Petrified Forest National Park by 2 nm and instructions for VR-125 should include avoidance of the Gran Quivira Unit of Salinas Pueblo Missions National Monument by 3 nm. Avoidance criteria may also be needed for Hubbell Trading Post National Monument, Fort Union National Monument and the Abo and Quarai Units of Salinas Pueblo Missions National Monument (we are assuming that a lateral avoidance of 3 nm means 3 nm from all points of the park boundary, not 3 nm from the main cultural or natural feature within the park.)

**(5)** Due to the potential for pilot error during training and to higher noise levels due to overlap of training routes, we recommend that vertical avoidance criteria (such as the 2,000' above ground level (AGL) vertical clearance recommended in the Federal Aviation Administration Advisory Circular 91-36C) also be considered for all National Park System units affected. This would more fully assure protection of park values and the quality of the visitor experience.

**(6)** We also recommend that consideration be given to installing noise monitoring/measuring equipment in several park areas in order to test the effectiveness of the special operating procedures in reducing impacts to these

(6) areas. Potential test parks could be those which will experience the largest increase in flyovers and those which are subject to overlap effects, such as Capulin Volcano and Salinas Pueblo Missions National Monuments. The National Park Service would be pleased to assist in establishing monitoring sites.

(7) We further recommend that subsequent environmental documentation prepared for this proposed action include a discussion of all mineral resources in the affected area, any mineral precaution, and expected impacts resulting from implementation of the plan. If no adverse impacts on mineral resources or production facilities have been identified, beyond the existing restrictions, a statement to that effect should be included so readers will know mineral resources, and any impact to these resources, were considered.

(8) The current proposal would relocate 28 additional aircraft to Cannon AFB, increasing the total complement from 77 to 105 aircraft. Annual sorties from Cannon AFB would rise from about 11,000 to 15,000, and substantially increase airspace utilization over northern and eastern New Mexico, as well as portions of western Texas, southern Colorado, and northeastern Arizona. These areas include the Pecos Military Operations Area (MOA), Mount Dora MOA, Melrose Bombing Range, Oscura Range, Red Rio Range, and set of Military Training Route (MTR's) IR-107, IR-109, IR-110, IR-111, IR-112, IR-113, VR-100, VR-108, VR-114, and VR-125. In regard to these MOA's, areas of particular concern to the DOI are the migration routes and winter habitat of waterfowl and other migratory birds. These areas include the playa lakes region of eastern New Mexico, southeastern Colorado and western Texas, the Pecos River and Canadian River Valleys of New Mexico, the Rio Grande, and San Luis Valleys of north-central New Mexico and south-central Colorado, and the Laguna del Perro area in Torrence County, New Mexico. The Pecos MOA is just north of Bitter Lake National Wildlife Refuge (NWR), near Roswell, New Mexico, while IR-109 passes south of Monte Vista/Alamosa NWR, near Alamosa, Colorado. These refuges are populated by large numbers of waterfowl during fall and spring migrations. Bitter Lake is winter home to tens of thousands of ducks, geese, and cranes. Monte Vista/Alamosa NWR is a principal stopover for the Gray's Lake flock of endangered whooping cranes. Any impact to waterfowl, other migratory birds, or units of the NWR system resultant from an increase of airspace utilization should be thoroughly examined. In addition, these birds fly at altitudes which make them vulnerable to collision with aircraft. Therefore, for safety reasons, aircraft sorties should be scheduled and/or routed to avoid areas of seasonal waterfowl concentration.

(9) Some of the MTR's traverse mountain ranges as well, including the Mogollon Plateau in Arizona, the Sangre de Cristo range in north-central New Mexico, and the Capitan, Sacramento, and White Mountains in south-central New Mexico. These mountains and intervening valleys provide year-round habitat for elk, mule deer, black bear, and a wide variety of non-game species. North-south oriented ridges also provide important migration routes, as well as essential nesting and foraging habitat for raptors. Any impact to these wildlife species resultant from an increase of airspace utilization should be documented, as well. In addition, in order to protect wildlife during their sensitive breeding periods, we recommend that seasonal restrictions on aircraft operations in certain areas be included and analyzed as mitigating measures.

We question the finding that the proposed action would have no adverse impact on surface water resources. The Draft EIS states that the existing wastewater treatment facility at Cannon AFB would be adequate to handle the anticipated additional volume of sewage. The facility currently discharges wastewater through a series of facultative lagoons to a playa lake on the base. Playa lakes are considered surface waters of the United States which provide important habitat for a variety of resident and migratory wildlife. (10) Discharges of wastewater to such are regulated under Section 402 of the Clean Water Act and require a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits set specific numerical standards for certain water quality criteria and require periodic monitoring to ensure compliance with these standards. However, it is our understanding that the wastewater treatment facility at Cannon AFB currently is operating without an NPDES permit. As such, an analysis should be conducted, and contained in this document, to determine if wastewater treatment discharges are adversely impacting surface water resources.

#### SPECIFIC COMMENTS

Page 1-3. In a letter dated February 23, 1990, to Captain Wilfred Cassidy of the Tactical Air Command (TAC), Langley AFB, Virginia the U.S. Fish and Wildlife Service provided comment on a similar proposal to base 46 additional F-111 aircraft at Cannon AFB. These previous comments expressed concern about the presence, generation, and disposal of toxic and hazardous wastes at Cannon AFB. These concerns were not adequately addressed in the 1990 TAC Draft EIS, and the current Draft EIS dismisses the potential impacts of its proposed action on Page 1-3: "As a result, waste and effluent generation under the proposed action is considered to differ in no substantive manner from that assessed TAC, 1990." Reference in this Draft EIS to a flawed analysis in the 1990 document fails to respond to these concerns. As such, we again recommend that a comprehensive analysis be conducted to ascertain the environmental consequences of producing additional volumes of solid and hazardous wastes as well as industrial and domestic wastewater. (11)

Page 2-8. Table 2-4 contains numerous inconsistencies. For example, the proposed annual increase in sorties departing from Cannon AFB is only 3,934, while the Melrose Range, Mount Dora MOA, and Pecos MOA would experience increases in utilization of 4,310, 6,768, and 6,234 sorties, respectively. Each of these exceeds the total number of flights departing Cannon AFB. The total number of sorties going to the Mount Dora MOA (8,596) is almost a five-fold increase from the level of use previously evaluated by TAC. However, the current Draft EIS cites the 1990 TAC report as sufficient to address the greater impacts of the proposed action. The final EIS should reconcile these apparent inequities to more accurately reflect the anticipated increase in airspace utilization and assess the concomitant impacts to wildlife resources. (12)

Page 3-6. References to the "Gran Quivira National Monument" should be changed to the Gran Quivira Unit of Salinas Pueblo Missions National Monument. It should be noted that the Abo and Quarai Units of the Monument are also in close proximity to the training route. (13)

(14) | Page 3-13. References to "Capulin Mountain National Monument" should be changed to "Capulin Volcano National Monument."

(15) | Page 3-74. Table 3.6-1 should be expanded to include the following species listed or proposed for listing as threatened or endangered:

(15) | Interior least tern (Sterna antillarum athalassos) - Endangered  
 Aplomado falcon (Falco femoralis septentrionalis) - Endangered  
 Pecos bluntnose shiner (Notropis simus pecosensis) - Threatened  
 Mexican spotted owl (Strix occidentalis lucida) - Proposed Threatened

(16) | On November 4, 1991, the U.S. Fish and Wildlife Service published in the Federal Register, Vol. 56, No. 213, pages 56344-55, a proposal to list the Mexican spotted owl as a threatened species, as well. Under Section 7(a)(4) of the Endangered Species Act, a Federal agency shall confer with the Fish and Wildlife Service on any of the agency's actions which is likely to jeopardize the continued existence of any species proposed for listing. We recommend that this consultation be immediately initiated to make these determinations.

In addition, the following Category 2 candidate species are likely to occur in the affected areas:

Greater western mastiff bat (Eumops perotis californicus)  
 Occult little brown bat (Myotis lucifugus occultus)  
 Spotted bat (Euderma maculatum)  
 Arizona black-tailed prairie dog (Cynomys ludovicianus arizonensis)  
 New Mexican jumping mouse (Zapus hudsonius luteus)  
 Swift fox (Vulpes velox)

(17) | White-faced ibis (Plegadis chihi)  
 Mountain plover (Charadrius montanus)  
 Western snowy plover (Charadrius alexandrinus nivosus)  
 Long-billed curlew (Numenius americanus)  
 Northern goshawk (Accipiter gentilis)  
 Ferruginous hawk (Buteo regalis)  
 Southwestern willow flycatcher (Empidonax traillii extimus)

Boreal western toad (Bufo boreas boreas)  
 Sacramento Mountain salamander (Aneides hardii)

Rio Grande shiner (Notropis jemezanus)  
 White Sands pupfish (Cyprinodon tularosa)

Category 2 candidates are species for which the Fish and Wildlife Service has information indicating that proposing to list is possibly appropriate, but for which substantial data on biological vulnerability or threats are not currently available to support the immediate preparation of proposed rules. Candidate species have no legal protection under the Endangered Species Act and are included in this review for planning purposes only. We would appreciate receiving any information relevant to the status of any candidate species that may have been acquired in preparing this Draft EIS.

(18) Page 3-80. Descriptions of the Abo and Quarai Units of Salinas Pueblo Missions National Monument should be provided along with the description of the Gran Quivira Unit.

#### SUMMARY

In conclusion, it is our opinion that this Draft EIS is deficient in several critical areas. It relies on information and conclusions from the 1990 TAC Draft EIS, in which a great number of analyses were either completely absent or flawed. Previously mentioned Fish and Wildlife Service comments on the 1990 TAC Draft EIS were not adequately addressed in the current document, which only perpetuates the inadequacy of the earlier document. Adverse impacts to cultural and natural resources, including wildlife resources, particularly migratory waterfowl and raptors, are not adequately assessed in this document. This Draft EIS relies on a TAC description of impacts for the Mount Dora MOA which was based on one-fifth as many sorties as the current proposal. Furthermore, this Draft EIS proposes no mitigation measures to avoid or minimize adverse impacts. Such measures could include temporal or spatial restrictions on aircraft operations over waterfowl concentration areas, raptor nesting habitat, and their migration routes. These aspects all need to be considered.

In addition, generation and disposal of additional quantities of hazardous wastes and domestic wastewater could continue to impact water quality at Cannon AFB. Discharge of wastewater to the Base playa lake must be in compliance with Section 402 of the Clean Water Act. An NPDES permit is required to fully comply with this Act thereby ensuring protection of water quality. As stated earlier, these concerns were expressed in response to the 1990 TAC document. This Draft EIS states only that the current proposal is not substantively different from the earlier TAC proposal. Therefore, our concerns with regard to water quality impacts are still valid and must be addressed in the final EIS.

Provided the concerns expressed herein are addressed in the Final EIS and adequate mitigation is incorporated into the proposed action and other alternatives under consideration to safeguard cultural and natural resources including wildlife and their habitats we would not take further issue. Our preference is to equitably resolve these issues before completion of the Final EIS. In this regard, please feel free to contact us at the above address or call (505) 766-3565 or FTS 474-3565. However, provided our concerns remain unresolved, as a last resort, we are prepared to refer this proposal and our differences to the Council on Environmental Quality for resolution.

Thank you for the opportunity to review and provide comment on this Draft EIS.

Sincerely,

  
Raymond P. Churan  
Regional Environmental Officer

Star Route, Box 94  
Mt. Dora, NM 88429  
February 14, 1992

Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA 23665  
FAX: 804-764-5363

Dear Ms. Cook:

We are very concerned about the additional traffic in the Mt. Dora MOA which will result from the expansion of the F-111 Fighter Wing at Cannon Air Force Base near Clovis, New Mexico.

19 We have an active private air strip eight miles south of Mt. Dora and fly many times a week to a ranch in the Raton area.

We have already had some near misses and would appreciate any cooperation to eliminate this hazard.

Yours truly.

J.W. Heringa  
J.W. Heringa



U.S. Department  
of Transportation  
Federal Aviation  
Administration

Southwest Region  
Arkansas, Louisiana,  
New Mexico, Oklahoma,  
Texas

Fort Worth, Texas 76193-0000

FEB 10 1992

Ms. Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA 23665-5542

Dear Ms. Cook:

I have completed my review of the Cannon AFB Realignment Environmental Impact Statement (EIS).

From an Airports Division perspective, I have no comments to submit on the EIS. I have, however, passed the document on to our Air Traffic Division for their review and comments. As I read through the document, I felt there was a definite possibility for airspace conflicts with increased traffic as a result of the realignment.

I am certain our Air Traffic people will be forwarding comments to you in the near future. The individual I have contacted in Air Traffic is Mr. Hal Johnson, ASW-530.

I appreciate having the opportunity to review the EIS. If you have any questions, please call me at (817) 624-5608.

Sincerely,

*Joyce M. Porter*  
Joyce M. Porter  
Environmental Specialist  
NM/OK Airport Development Branch

- TOGETHER WE SUCCEED -



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control

Atlanta GA 30333

February 7, 1992

Brenda Cook  
HQ TAC/DEVE  
Langley AFB, Virginia 23665

Dear Ms. Cook:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for the F/EF-111 Basing at Cannon Air Force Base (AFB), New Mexico. We are responding on behalf of the U.S. Public Health Service.

We have reviewed the DEIS for potential adverse impacts on human health, and we believe related issues have been adequately addressed. Thank you for the opportunity to review and comment on this draft document.

Please ensure that we are included on your mailing list to receive a copy of the Final EIS, and future DEIS's which may indicate potential public health impacts and are developed under the National Environmental Policy Act (NEPA). Please remove David Clapp from your mailing list.

Sincerely yours,

Kenneth W. Holt, M.S.E.H.  
Special Programs Group (F29)  
National Center for Environmental  
Health and Injury Control

31 Winton May 1942

20-2776

After we located there to our  $1\frac{1}{2}$  mi  
East of Linton Air Force Base. It is  
located at the Marker #13 on State Hwy 45  
South of the base

Until recently we were not real concerned  
about base expansion affecting us. But -  
in last month time has been  
a lot of noise from the base. - millions  
will start at 7:00 AM and last until  
30 or 12:00 midnight. I have called the base  
several times to complain. The noise is  
so loud & vibrates everything (person & possession,  
the explanation I get from the base is  
they are working on engines outside of their  
"Quiet House." Almost all work outside of their  
"Quiet House" results in a deafening roar at our  
"Quiet House." These Roaring noises are  
so loud during the day light hours and  
most intolerable during the evening especially  
the bed time hours when they can & do wake  
us from a sound sleep.

We would occasionally have these noises in the past, but it is getting progressively worse. It is so bad at times the windows rattle so bad you can not hear your T.V.

We are concerned ~~as~~ about the noise being more extensive with expansion. We are concerned because as it is now, in the summer we will not be able to open windows due to noise. We are concerned about the length + intensity of the noise + sometimes really continual for 16 + 17 hours. We feel something needs to be done to curb the roaring noises outside of the "Jail House" again work. Especially after daylight hours. We are not in the flight pattern and we live on this farm for 30 years. It is just recently we have had concerns about our life, living here + health due to erosion expansion and ~~within~~ whether we are compatible -

Sincerely -

Pete & Patty Long

Rt 3 Box 17-A

Clarendon, N.H.

8/8/01

KIM M. MITCHELL  
TEQUESQUITÉ RANCH  
ALBERT, NEW MEXICO 87733  
PHONE (505) 673-2205  
FAX (505) 673-2203

February 14, 1992

Langley AFB  
Attn: Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA. 23665

Transmitted via FAX to (804)764-5363

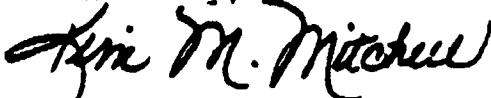
Dear Ms. Cook:

21 I just read today in the "Union County Leader" that Cannon AFB is planning an expansion of the Mt. Dora and Pecos MOA's and MTR's. Since the official newspaper of the affected counties was not notified of the public meetings I am requesting that the official deadline for public input be extended from February 16th for at least a month to allow for local county meetings with a representative from Cannon, AFB.

Please contact me if you have any questions.

Thank you for your time.

Sincerely,



Kim M. Mitchell

cc: Senator Pete V. Domenici  
Senator Jeff Bingaman  
Rep. Steven Schiff  
Rep. Joseph R. Skeen  
Rep. Bill Richardson  
Governor Bruce King

KAREN MITCHELL  
TEQUESQUITE RANCH  
ALBERT, NEW MEXICO 87733  
PHONE (505) 673-2204  
FAX (505) 673-2203

February 14, 1992

Langley AFB  
Attn: Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA. 23665

Transmitted via FAX to (804)764-5363

Dear Ms. Cook:

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Please contact me if you have any questions.

Thank you for your time.

Sincerely,

*Karen Mitchell*

Karen Mitchell

cc: Senator Pete V. Domenici  
Senator Jeff Bingaman  
Rep. Steven Schiff  
Rep. Joseph R. Skeen  
Rep. Bill Richardson  
Governor Bruce King

LYNDA E. MITCHELL  
TEQUESQUITE RANCH  
ALBERT, NEW MEXICO 87733  
PHONE (505) 673-2202  
FAX (505) 673-2203

February 14, 1992

Langley AFB  
Attn: Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA. 23665

Transmitted via FAX to (804)764-5363

Dear Ms. Cook:

I just read today in the "Union County Leader" that Cannon AFB is planning an expansion of the Mt. Dora and Pecos MOA's and MTR's. Since the official newspaper of the affected counties was not notified of the public meetings I am requesting that the official deadline for public input be extended from February 16th for at least a month to allow for local county meetings with a representative from Cannon, AFB.

Please contact me if you have any questions.

Thank you for your time.

Sincerely,

*Lynda E. Mitchell*

Lynda E. Mitchell

cc: Senator Pete V. Domenici  
Senator Jeff Bingaman  
Rep. Steven Schiff  
Rep. Joseph R. Skeen  
Rep. Bill Richardson  
Governor Bruce King

TERRY R. MITCHELL  
TEQUESQUITE RANCH  
ALBERT, NEW MEXICO 87733  
PHONE (505) 673-2205  
FAX (505) 673-2203

February 14, 1992

Langley AFB  
Attn: Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA. 23665

Transmitted via FAX to (804) 764-5363

Dear Ms. Cook:

21 I just read today in the "Union County Leader" that Cannon AFB is planning an expansion of the Mt. Dora and Pecos MOA's and MTR's. Since the official newspaper of the affected counties was not notified of the public meetings I am requesting that the official deadline for public input be extended from February 16th for at least a month to allow for local county meetings with a representative from Cannon, AFB.

Please contact me if you have any questions.

Thank you for your time.

Sincerely,

*Terry R. Mitchell*

Terry R. Mitchell

cc: Senator Pete V. Domenici  
Senator Jeff Bingaman  
Rep. Steven Schiff  
Rep. Joseph R. Skeen  
Rep. Bill Richardson  
Governor Bruce King

THOMAS E. MITCHELL, III  
TEQUESQUITE RANCH  
ALBERT, NEW MEXICO 87733  
PHONE (505) 673-2204  
FAX (505) 673-2203

February 14, 1992

Langley AFB  
Attn: Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA. 23665

Transmitted via FAX to (804)764-5363

Dear Ms. Cook:

② I just read today in the "Union County Leader" that Cannon AFB is planning an expansion of the Mt. Dora and Pecos MOA's and MTR's. Since the official newspaper of the affected counties was not notified of the public meetings I am requesting that the official deadline for public input be extended from February 16th for at least a month to allow for local county meetings with a representative from Cannon, AFB.

Please contact me if you have any questions.

Thank you for your time.

Sincerely,



Thomas E. Mitchell, III

cc: Senator Pete V. Domenici  
Senator Jeff Bingaman  
Rep. Steven Schiff  
Rep. Joseph R. Skeen  
Rep. Bill Richardson  
Governor Bruce King

3



Richard D. Hammer  
CHAIRMAN  
Michael E. Lewis  
1ST VICE-CHAIRMAN  
Matthew Baca  
MEMBER

County of Harding  
Board of Commissioners

P.O. BOX 1002  
MOSQUERO, NEW MEXICO 87733  
PHONE: (505) 573-2927

February 14, 1992

Langley Air Force Base  
Brenda Cook  
HQ TAC/DEVE  
Langley AFB, VA 23655

Dear Ms. Cook:

In the February 12th edition of the Union/Harding County Leader we were appalled at not receiving information concerning notices of public meetings held for the purpose of public input on the expansion of the Cannon Air Force Base in Clovis, NM.

The Harding County Commissioners are quite concerned about the expansion and the incumbent increase of low level flight in the Mount Dora Military Operations Area which encompasses Harding County. We would like input on this expansion and therefore would appeal for a sixty (60) day postponement deadline concerning comment.

21 Your consideration and assistance in this matter is greatly appreciated.

Sincerely,

*Richard D. Hammer*

Richard D. Hammer  
Commission Chairman

RDH/aba



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200  
DALLAS, TEXAS 75202-2733

February 18, 1992

General Michael A. McAuliffe  
HQ TAC/DE  
Langley Air Force Base, Virginia 23665

Dear General McAuliffe:

In accordance with our responsibilities under Section 309 of the Clean Air Act, The National Environmental Policy Act (NEPA), and the Council on Environmental Quality Regulations for Implementing NEPA, we have completed our review of the Draft Environmental Impact Statement (EIS) for the proposed relocation of F/EF-111s to Cannon Air Force Base (AFB), New Mexico.

The Defense Base Closure and Realignment Commission, in fulfillment of their duties, recommended relocating 105 F/EF-111 aircraft from their current bases. Because the President adopted the recommendations and Congress did not reject them, the Air Force by law must implement the relocations. The Air Force decided to relocate the aircraft to one base within the Continental United States (CONUS). There are only two bases in CONUS currently supporting F/EF-111s, Mountain Home AFB, Idaho, and Cannon AFB, New Mexico. Mountain Home AFB is included on the list to have their F/EF-111s relocated, thus the Air Force has proposed to move all the aircraft to Cannon AFB.

The Draft EIS provides four alternative solutions: 1) no action; 2) the proposed move to Cannon AFB; 3) delaying the move; and 4) alternative locations. The no action alternative, due to the recommended relocations becoming law, would force the retirement of these aircraft. This is not considered feasible. Delayed action is not considered acceptable because it will cause a delay in other actions the Air Force has planned at Mountain Home AFB or will cause the retirement of the EF-111s at that base. Alternative locations were rejected, because aircraft and their missions and requirements are matched with bases and only Cannon AFB is structured to meet the requirements of the F/EF-111s. It would be extremely expensive and disruptive of the basing program to relocate these aircraft to other bases.

We classify your Draft EIS as Lack of Objection (LO). Specifically, EPA has no objection to the preferred alternative. The EIS adequately addresses the environmental impacts of the proposed action and the alternatives.

Our classification will be published in the Federal Register according to our responsibilities under Section 309 of the Clean Air Act.

We appreciate the opportunity to review the Draft EIS. Please send our office one copy of the Final EIS at the same time it is sent to the Office of Federal Activities, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460

Sincerely yours,



B. J. Wynne  
Regional Administrator



**APPENDIX E**  
**RESPONSES TO COMMENTS**

## APPENDIX E RESPONSE TO COMMENTS

The following provides a response to the numbered comments presented in Appendix D. A brief precis of each numbered comment is also provided.

1. COMMENT: Incorporation of mitigation measures in the proposed action and alternatives and discussion of mitigation in Chapter 3.

RESPONSE: Chapter 3, section 3.4.2, lists published special operating procedures found in Flight Information Publication AP/1B. These procedures have been in effect for some time and are now part of normal operations governing sorties on military training routes; thus, it is proper to discuss them as part of the existing conditions. They are not mitigation measures in the context of the CEQ regulations.

2. COMMENT: Effectiveness of mitigation.

RESPONSE: Special operating procedures for IR-107 require lateral avoidance of Capulin Volcano National Monument by 2 nautical miles. Special operation procedures are designed to preclude overflight of these kinds of resources in order to protect the resource value. Since negotiating the special operation procedure, we have not been advised that the restricted flight envelope has not been effective in meeting DOI's objectives.

3. COMMENT: Visitor experience at National Park System sites should be considered.

RESPONSE: All units of the National Park System referred to, with the exception of the Petrified Forest National Park, are outside the military training route (MTR) width. Consequently, there is no anticipated impact to the visitor experience at these units. Instrument route (IR)-112, which overflies the southern most portion of the Petrified Forest National Park, was originally scheduled to receive an additional 1,351 sorties under the proposed action. As a result of the analysis, the number of proposed sorties has been reduced to 250 additional annual sorties. Location of National Park Service sites in close proximity to affected airspace has been indicated in the text.

4. COMMENT: Vibrational damage to cultural resources due to noise impacts from aircraft flyovers.

RESPONSE: Vibrational impacts are discussed in section 4.1.8.1.2 of the EIS under Archaeological Resources and Native American Values. As stated, the Air Force will continue to avoid overflight of identified areas to the maximum extent possible commensurate with mission requirements.

5. COMMENT: Need for additional avoidance criteria.

RESPONSE: Generally, the Air Force observes the FAA 2,000 ft. minimum altitude request for flights over National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service lands whenever possible, except in Special Use Airspace. AFR 60-16 requires a minimum altitude of 500 ft. in all areas. Additional special operating procedures and avoidance criteria have been adopted on an individual basis for specific sites.

6. COMMENT: Installation of noise monitoring/measuring equipment in park areas.

RESPONSE: The U.S. Congress, through Public Law 100-91, directed studies to be conducted to examine the noise environment within units of the National Park System and Wilderness Areas. These studies are currently ongoing. Early indications of the data suggests military overflights are probably a limited element of the overall noise environment. Special operating procedures are an additional measure to help minimize potential impacts.

7. COMMENT: Consideration of mineral resources.

RESPONSE: During initial scoping (Section 1.2), minerals were not identified as a resource which would be affected by this action. Proposed construction activity at Cannon AFB or Melrose Range are of modest scale and would not adversely affect access to mineral resources. Overflight of areas containing such resources would not preclude use of these resources at some point in the future. The Air Force is not aware of any information which would warrant more detailed analysis of the effect of the proposed action on this resource.

8. COMMENT: Schedule/route aircraft sorties away to avoid areas of seasonal waterfowl concentration.

RESPONSE: The Air Force is equally concerned about Bird Strike Potential. The airspace utilized under the proposed action has been employed for a number of years and the bird strike incident rate has been low compared to other areas with similar concerns. The Air Force evaluation indicates the proposed increase in sorties would not materially change this risk ratio. As in the past, the Air Force is willing to work with the Service to evaluate specific areas of concern.

9. COMMENT: Document impacts to wildlife resultant from increase in airspace utilization under MTRs, and include seasonal restrictions on aircraft operations during breeding periods.

RESPONSE: The Air Force considered the effects on wildlife and has determined the impacts are minimal. Seasonal restrictions on aircraft operation are presently in place. The Air Force does not believe additional measures are required.

10. COMMENT: Conduct analysis on wastewater discharges.

RESPONSE: Cannon AFB is currently in compliance with Section 402 of the Clean Water Act. Construction of a 1 million gallon per day wastewater treatment facility is planned for the near future, which would preclude continued use of the lagoons for sewage treatment. This will eliminate discharge into local playas which has had potential for affecting the suitability of wildlife habitat on base.

11. COMMENT: Further analyze impacts due to additional volumes of solid and hazardous waste, industrial and domestic wastewater.

RESPONSE: The assessment of this action indicates quantities of generated waste would not exceed the current waste handling capacity and would not result in significant environmental impacts.

12. COMMENT: Reconcile inequities of increased airspace utilization.

RESPONSE: Sortie numbers are not additive as the comment suggests. Aircraft departing Cannon AFB, would train in more than one parcel of airspace in order to maximize training time and the return on the financial resources invested in the sortie.

13. COMMENT: Change references to "Gran Quivira National Monument" to the "Gran Quivira Unit of Salinas Pueblo Missions National Monument" and include Abo and Quarai Units of the Monument.

RESPONSE: Appropriate text changes have been made throughout the document.

14. COMMENT: Change "Capulin Mountain National Monument" to "Capulin Volcano National Monument".

RESPONSE: Appropriate text changes have been made throughout the document.

15. COMMENT: Include species in threatened and endangered list.

RESPONSE: The indicated addition has been made to Table 3.6.1.

16. COMMENT: Consult with F&W Service on Mexican spotted owl.

RESPONSE: The Air Force will consult with the U.S. Fish and Wildlife Service on the Mexican spotted owl.

17. COMMENT: Provide acquired information on Category 2 candidate species.

**RESPONSE:** The Air Force will provide any relevant information on candidate species acquired during preparation of the Draft EIS.

**18. COMMENT:** Include description of the Gran Quivera, Abo, and Quarai Units of Salinas Pueblo Missions National Monument.

**RESPONSE:** Appropriate text added to section 3.1.2.

**19. COMMENT:** Potential for air collision with general aviation aircraft.

**RESPONSE:** Four conditions preclude any significant adverse impacts resulting from proposed military flight activity on the MTRs. First, in VFR conditions, all military, general aviation and commercial pilots flying within the boundaries of an IR or VR, regardless of the type of flight plan or whether or not under the control of a radar facility, are responsible to see and avoid other aircraft. In instrument weather conditions, ATC separation is required between military aircraft flying on IRs and other IFR aircraft operating in the enroute and airport area airspace environment. Secondly, MTR route information that military pilots review during flight planning includes information about all airports and interacting controlled airspace along the route. Thirdly, military scheduling agencies will notify FAA Flight Service Stations when an MTR will be activated and civil aircraft in the vicinity of an MTR can obtain this information prior to entering the MTR airspace. Finally, the projected sorties indicate an average increase of less than 2 sorties per day per route, and there are no modifications to any of the 10 MTRs that would change existing airspace relationships.

**20. COMMENT:** Existing noise at Cannon AFB is an annoyance to residents in the vicinity.

**RESPONSE:** Existing noise generated by aircraft maintenance operations is not caused by the proposed action. In general, any complaints about operations on base or caused by military aircraft are handled by the Cannon AFB Public Affairs Office [ (505) 784-4131]. This office will help identify the problem and work at a solution. In this case, modifications were being made to the Quiet House and the noise would only be temporary.

**21. COMMENT:** Request for extension of public comment period.

**RESPONSE:** See attached Exhibit 1.

**22. COMMENT:** Request for extension of public comment period.

**RESPONSE:** See response to Comment 21.

**EXHIBIT I**



## DEPARTMENT OF THE AIR FORCE

HEADQUARTERS TACTICAL AIR COMMAND  
LANGLEY AIR FORCE BASE VA 23665

6 MAR 1992

Thomas E. Mitchell, III  
Tequesquite Ranch  
Albert, New Mexico 87773

Dear Mr Mitchell

Thank you for your February 14, 1992 letter concerning our realignment of F/EF-111 aircraft at Cannon Air Force Base (AFB). We appreciate your concern about the increased military activity within New Mexico airspace, particularly in the Mt Dora Military Operations Area (MOA). Please be assured the realignment does not require creation of new airspace or modification of existing airspace. This action is a slight modification of the previous realignment assessed in the 1990 Environmental Impact Statement (EIS), which addressed the need to establish the Mt Dora MOA. Overall, the number of aircraft will decrease by two and there will be a minor increase in flight activity. Public comments generated during preparation of the 1990 EIS, along with comments received through public involvement with the current EIS, have been considered and addressed. We believe the concerns raised in the two EISs give a representative perspective of the issues and feel an extension of the comment period would provide comments which closely parallel those previously recorded.

In accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) and Air Force Regulations, we implemented a public participation program in order to solicit public involvement. These actions included local, regional and national media coverage of the planned realignment. Public scoping meetings and public hearings were held to determine significant issues to be analyzed and allow the public to comment on the draft EIS (DEIS). Prior to each scheduled meeting, public releases were made by Cannon AFB to the major media sources (including 22 newspapers, 16 radio and 13 television stations) servicing the affected areas. Although the Union County Leader was not one of the newspapers that received the public release, the media coverage did blanket the area normally serviced by this newspaper.

After careful consideration of your request, we are unable to provide an extension of the public comment period. We believe the public comment period for the EIS was adequate and an extension would unnecessarily lengthen the NEPA process and impact the program. However, we will provide you a copy of the draft EIS and add your name to the mailing list for the Final document.

In the spirit of being a good neighbor, we are willing to work with you and try to resolve your concerns over flight activities to the maximum extent possible. Although we are unable to extend the public comment period, we would be happy to work with you on your concerns through our community relations program. Cannon AFB personnel have contacted community leaders and will meet with citizens and officials to discuss areas of concern. Our point of contact for this matter is Maj Rick Olsen, Cannon Air Force Base Public Affairs Office, at (505) 784-4131.

Sincerely



GILBERT N. BURNET  
Acting Director, Environmental Programs

**APPENDIX F**  
**FEDERAL THREATENED AND ENDANGERED SPECIES**

Species List  
EF/F-111 Relocation to Cannon Air Force Base  
Science Applications International Corporation  
for the United States Air Force  
Arizona, Colorado, New Mexico, and Texas  
December 17, 1991

Endangered

Black-footed ferret (Mustela nigripes) - This species is usually found in association with prairie dog towns in grassland plains and surrounding mountain basins up to 10,500 feet elevation. Surveys for black-footed ferrets are required if the action affects a black-tailed prairie dog town over 80 acres or a white-tailed or Gunnison's prairie dog town over 200 acres. If a prairie dog town is greater than 1,000 acres, the area should be evaluated for possible reintroduction of black-footed ferrets.

Authority: Dean Biggins, U.S. Fish and Wildlife Service, 1300 Blue Spruce Drive, Fort Collins, Colorado 80524, (303) 226-9467.

Whooping crane (Grus americana) - Occupies the project area October through February. Roosts on gravel bars and islands in the Rio Grande. Feeds in cultivated fields and wetlands within several miles of the Rio Grande.

Authorities: James Lewis, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103, (505) 766-3972, and Roderick Drewien, c/o Bosque del Apache National Wildlife Refuge, P.O. Box 1246, Socorro, New Mexico 87801, (505) 835-1828.

Interior least tern (Sterna antillarum athalassos) - This species nests on sandy beaches on shorelines of streams, rivers and lakes and is found on Bitter Lake National Wildlife Refuge.

Authority: John P. Hubbard, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-2438.

Bald eagle (Haliaeetus leucocephalus) - Occupies New Mexico primarily as a winter resident, but also occurs as a migrant with several nesting in the state. Roosts in large trees which may or may not be close to their feeding areas. Bald eagles are found in riparian areas adjacent to rivers, reservoirs, and ponds. Rabbits, fish and waterfowl are their primary prey items.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

American peregrine falcon (Falco peregrinus anatum) - The peregrine falcon prefers areas with steep rocky cliffs in close proximity to water. Preferred habitat contains dense bird populations in conjunction with large gulfs of air such as is in canyons.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Aplomado falcon (Falco femoralis septentrionalis) - This species is very rare in New Mexico. The historic range of this bird includes Catron, Chaves, Dona Ana, Eddy, Grant, Hidalgo, Lea, Lincoln, Luna, Otero, Sierra, and Socorro Counties. This species is found in open woodland, savanna, or grassland habitats.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Threatened

Pecos bluntnose shiner (Notropis simus pecosensis) - Present distribution of this species is the Pecos River from Santa Rosa to Artesia. Essential habitat for the adults includes the main river channel with permanent water, a sandy substrate, and low velocity flow. Subadults also use backwaters, pools, and riffles. Some individuals have also been found in natural springs.

Authority: Gerald Burton, U.S. Fish and Wildlife Service, Ecological Services Office, 3530 Pan American Highway, NE., Suite D, Albuquerque, New Mexico 87107, (505) 883-7877, and Dr. David Propst, Department of Game and Fish, Santa Fe, New Mexico 87503, (505) 827-9906.

Proposed

Mexican spotted owl (Strix occidentalis lucida) - Proposed as threatened on November 4, 1991, the Mexican spotted owl has been recorded in all New Mexico national forests at elevations of 3,700 to 10,000 feet. Habitat consists of caves, cliff ledges, witch's-broom, and stick nests of other species in mature and old growth forest associated with steep canyons. Preferred vegetation is mixed conifer; however, spotted owls can be found in pinyon-juniper, pine-oak, and ponderosa pine.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Category 2 Candidates

Greater western mastiff bat (Eumops perotis californicus) - This bat roosts on or in buildings and crevices in cliffs, and in trees and mine tunnels.

Authority: Scott Altenbach, University of New Mexico, Department of Biology, Albuquerque, New Mexico 87131, (505) 277-3411.

Occult little brown bat (Myotis lucifugus occultus) - This species is a montane dweller and roosts in natural caves, mine tunnels, hollow trees, or buildings.

Authority: Scott Altenbach, University of New Mexico, Department of Biology, Albuquerque, New Mexico 87131, (505) 277-3411.

Spotted bat (Euderma maculatum) - This bat is found in several national forests in New Mexico. This species tends to occur in remote areas, selecting specialized roosting sites. The presence of streams and nearby cliffs or steep hillsides with loose rocks may be habitat for this bat.

Authority: Scott Altenbach, University of New Mexico, Department of Biology, Albuquerque, New Mexico 87131, (505) 277-3411.

Arizona black-tailed prairie dog (Cynomys ludovicianus arizonensis) - This species is found on flat, dry, open grasslands of mesa tops or valley bottoms within broad limits of the Upper Sonoran Zone. Dona Ana County is within the historic range of this mammal.

Authority: John Hubbard, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9925.

New Mexican jumping mouse (Zapus hudsonius luteus) - This species occurs at localized sites in the Jemez and Sacramento Mountains of New Mexico and the White Mountains of Arizona. It also occurs at four sites along the Rio Grande River. This jumping mouse occupies habitat close to permanent free flowing water with vegetation of a diverse composition. The flora primarily consists of a tall, dense cover of grasses, forbs and willow, close to higher dry areas suitable for nesting and hibernation.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9904

Swift fox (Vulpes velox) - Prefers open desert and plains. Usually found in short-grass prairie with loose sandy soil.

Authority: John Hubbard, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9925.

White-faced ibis (Plegadis chihi) - This species inhabits salt and freshwater marshes, shallow margins of muddy pools, ponds, and rivers.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Mountain plover (Charadrius montanus) - This species is primarily found in short grass prairies often associated with prairie dog towns. Nest sites are chosen in flat country with sparse and low-lying vegetation. This bird feeds exclusively on insects; primarily beetles, grasshoppers, and crickets.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Western snowy plover (Charadrius alexandrinus nivosis) - Inhabits flat sandy areas, alkali flats, and areas near water which are devoid of vegetation or have very little vegetation.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Long-billed curlew (Numenius americanus) - This species inhabits grassy plains and prairies, lakes and rivers, mud flats, and salt and freshwater marshes. Usually associated with wetlands that are located in grasslands area.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Apache northern goshawk (Accipiter gentilis apache) - A heavy bodied accipiter with a dark grey-blue back, grey underparts, dark crown, broad white eye stripe, barred tail, and white undertail coverts. This species prefers dense coniferous forests and pine-oak woodlands, and other wooded areas.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Ferruginous hawk (Buteo regalis) - Found almost statewide during migration. This bird seems to key in on wide open grasslands and prairies, especially for nesting.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Southwestern willow flycatcher (Empidonax traillii extimus) - This species inhabits thickets, riparian woodlands, pastures, and brushy areas.

Authority: Sandy Williams, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9914.

Boreal western toad (Bufo boreas boreas) - is exclusively a high mountain dweller. Restricted to the vicinity of open water, usually associated with beaver ponds. Currently known from only two locations: Canjilon and Lagunitas in the San Juan Mountains, Rio Arriba County, New Mexico.

Authority: Charlie Painter, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9901.

Sacramento Mountain salamander (Aneides hardii) - This species is found in the Capitan and White Mountains of Lincoln County and the Sacramento Mountains of Otero County. It is usually seen during periods of summer rains under bark and inside rotting logs, in old rockslides, and beneath logs, bark, and boards in forests of Douglas fir, white fir, and spruce, usually most abundant on north and east-facing slopes. The salamander emerges in late June and July. Found at elevations 8,400 to 11,000 feet.

Authority: Charlie Painter, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9901.

Texas horned lizard (Phrynosoma cornutum) - This species inhabits arid and semiarid open country with sparse plant growth--bunch grass, cactus, juniper, acacia, and mesquite. Substrates may be sand, loam, hardpan, or rock. Some loose soil is usually present in which these lizards bury themselves. They also seek shelter under shrubs or rocks or in burrows of other animals.

Authority: Charlie Painter, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9901.

Arkansas River shiner (Notropis girardi) - Inhabits shallow, often turbid channels of major streams and rivers. Prefers uniformly sandy substrates. Found in the Pecos and Canadian River basins.

Authority: David Propst, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9906.

Rio Grande shiner (Notropis jemezanus) - Inhabits large, open rivers with minimal aquatic vegetation, and larger streams with a gravel, sand, or rubble substrate, sometimes overlain with silt. In New Mexico, the species occurs in the Pecos River from Guadalupe County to the Texas state line. Historically, it occurred in the Rio Grande from Taos County to the Texas state line.

Authority: David Propst, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9906.

White Sands pupfish (Cyprinodon tularosa) - Inhabits fine mud-silt and sand-gravel bottoms of clear, shallow, strongly alkaline pools and streams. Found in Salt Creek, Mound Spring, and Malpais Spring, and their associated outflow channels and wetlands where Lincoln, Otero, Sierra, and Socorro Counties converge.

Authority: David Propst, New Mexico Department of Game and Fish, Villagra Building, Santa Fe, New Mexico 87503, (505) 827-9906.